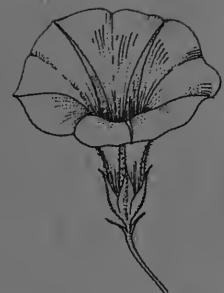


FLORA OF SOUTHERN AFRICA

VOLUME 28

Editor G. Germishuizen



Part 1: Convolvulaceae

by A.D.J. Meeuse and W.G. Welman



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FLORA OF SOUTHERN AFRICA

which deals with the territories of

SOUTH AFRICA, LESOTHO, SWAZILAND, NAMIBIA AND BOTSWANA

VOLUME 28

PART 1: CONVOLVULACEAE

by

A.D.J. Meeuse and W.G. Welman

Scientific editor: G. Germishuizen
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Pretoria
2000

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NEW TAXA AND NEW COMBINATIONS PUBLISHED IN VOLUME 28, PART 1

None.

Date of publication: February 2000.

INTRODUCTION

This part was compiled in accordance with the Guide for contributors to the *Flora of southern Africa* (compiled by Leistner, Ross & De Winter and available from the Editor, National Botanical Institute, Private Bag X101, Pretoria, 0001 South Africa).

The maps show the distribution of the various taxa in the *FSA* region only. Exotic species are marked with an asterisk in the relevant keys.

The numbering of genera is according to De Dalla Torre & Harms in their *Genera siphonogamarum* (1900–1907), as adapted by Arnold & De Wet (1993, *Plants of southern Africa: names and distribution*).

PREFACE

The family Convolvulaceae is retained in the circumscription according to Meeuse (1957a) and Verdcourt's (1963a) treatments, which are essentially that of Hallier f. (1893a) emended by Van Ooststroom (1953). The subfamilies Cuscuteae and Dichondreae are included and not treated as separate families—this is to avoid unnecessary splitting. Moreover, these two subfamilies are much more closely related to the other subfamilies in the Convolvulaceae than they are to any of the other families in the Solanineae of the Solanales from which the Convolvulaceae differ mainly in ovule and seed characters.

The classification into genera is very much the same as in the most recent floras (Verdcourt 1963a; Gonçalves 1987), but there is one change. *Turbina* sensu Meeuse (1957a) is sunk into *Ipomoea* *sensu lato*, at least as far as the southern African species are concerned. The only constant difference with *Ipomoea* *sensu stricto* is the indehiscence of the capsules, which is almost certainly attributable to an adaptation associated with seed dispersal. A dehiscent capsule such as that of *Ipomoea* *sensu stricto* releases several diaspores (normally four), whereas in the African species of *Turbina* the number of seeds is usually only one or two and dehiscence would not add anything or not so much to the number of diaspores and if there is a tendency towards fleshiness of the fruit wall and endozoochory, dehiscence would not serve a useful purpose. The southern African species formerly placed in *Turbina* form a very heterogeneous assembly and some of them resemble certain species or species groups of *Ipomoea* much more than the other ones do.

The pollen morphology plays an important role in dividing the family into subfamilies and genera (more or less smooth versus spinulose grains), and this feature is supported by other evidence such as the basic chromosome numbers. The pollen grains are mostly relatively large in the subfamilies in which the pollen morphology is critical, so that as a rule the ectexine sculpturing can be discerned under a binocular microscope enlarging up to 40 \times and sometimes even by means of a hand lens. The pollen morphology was the principal reason why the species with pantoporate grains were segregated as *Xenostegia* by Austin & Staples (1980). A dismemberment of the genus *Ipomoea* on the basis of the pollen morphology was attempted by Ferguson, Verdcourt & Poole (1977), but the scanning electron microscope studies of hundreds of species did not reveal a clear pattern, related species coming out in different groups of pollen types. A subdivision of *Ipomoea* can be performed only on a worldwide scale.

A survey of records of the chromosome numbers yields a fairly consistent number in several genera (*Ipomoea*, *Calystegia*, *Merremia*), but several varying numbers in other genera. *Ipomoea* has $2n = 30$, occasionally $2n = 28$ is reported. As may be expected, the cultivated *I. batatas* is apparently a hexaploid, with $2n = 90$. *Merremia* has $2n = 28$ or 30 and *Calystegia* has $2n = 22$.

The archetypical representatives of the Convolvulaceae probably were woody climbers, presumably of the *Erycibe* type, which grew in forest edges and clearings. Today, the climbing or rambling habit still prevails but herbaceous and shrubby to arborescent forms are not rare. Weak-stemmed prostrate forms are found in several genera; annuals are rare (except in the Cuscuteae). The family is cosmopolitan but mostly subtropical to tropical; many representatives occur in open to semiruderal habitats or in scrub vegetation. For that reason some species have become weeds,

e.g. *Cuscuta campestris* and *Convolvulus arvensis*, and are now widespread (see Henderson & Anderson 1966; Wells *et al.* 1986; Henderson *et al.* 1987).

The family is zoophilous and the most common diurnal visitors are Hymenoptera and Lepidoptera capable of reaching the nectar in the base of the flower tube, especially in the Convolvuleae and the Ipomoeae. Some species (mainly South American) are adapted to bird pollination and have red flowers in contrast to the usually white to mauve to purple or blue, less often yellow flowers. The crepuscular flowers are strongly scented (the diurnal ones hardly so), white to pink or pale yellow and are pollinated by hawk-moths. Diurnal flowers usually start wilting after about ten o'clock in the morning, unless the sky is overcast. Reports of bat-pollinated species (e.g. *Ipomoea albivenia*) need confirmation.

Apart from numerous ornamentals, the family has but few economic plants; the most important is *Ipomoea batatas* (the sweet potato) with its edible roots. Many species are used in traditional medicine, e.g. as purgatives or hallucinogens (see Watt & Breyer-Brandwijk 1962).

The ornamentals that are most commonly cultivated in the southern African region are listed in the text under the various genera. Species of the following exotic genera are also cultivated: *Argyreia nervosa* (Burm.f.) Bojer (from India, perennial climber with large leaves and pink flowers), *Mina lobata* Cerv. (from central and South America, herbaceous twiner with crimson to yellow flowers) and *Porana paniculata* Roxb. (from Southeast Asia, perennial climber with masses of small white flowers).

CONVOLVULACEAE

by A.D.J. MEEUSE* and W.G. WELMAN**

Annual or perennial herbs or woody plants, without tendrils, unarmed or rarely spinescent, often climbing or prostrate, more rarely erect and shrubby. *Roots* in herbaceous perennials often developed as thick taproots or as large fusiform to globose tubers. *Leaves* alternate, simple, often cordate, hastate or sagittate at base, entire, lobed or deeply pinnately, palmately or pedately dissected, exstipulate but occasionally pseudostipulate by leaves of developing or suppressed axillary shoots, usually petiolate, rarely absent or reduced to minute scales (*Cuscuta*). *Flowers* hermaphrodite, minute to large, regular, generally axillary, solitary or cymose, often aggregated into heads, rarely paniculate or approximated in a terminal spike, pedicellate or sessile; cymes usually pedunculate; solitary flowers or cymes usually with two deciduous, rarely accrescent bracteoles. *Calyx* inferior, sepals 5(4 or 3), free or rarely united at base, imbricate, equal or subequal, persistent, often accrescent. *Corolla* gamopetalous, usually funnel-shaped (sometimes hypocrateriform, campanulate, nearly tubular, urceolate or rotate), limb subentire or 5-lobed, rarely 5(4 or 3)-partite, in bud generally induplicate-valvate, often contorted, frequently \pm distinctly marked on outside by \pm hairy and veined midpetaline zones, separated by glabrous episepaline areas; tube in several genera a little above base provided with a partition around style with 5 equidistant holes. *Stamens* 5 (rarely 4 or 3), inserted low in corolla tube opposite sepals, sometimes in throat (*Cuscuta*); filaments equal or subequal, filiform, rarely stipulate or attached to scales; anthers introrse, ovate or oblong to nearly linear, often \pm sagittate at base, dorsifixed, dehiscing longitudinally; pollen either spherical and spinulose all over or \pm spherical and smooth or ellipsoid and marked with folds. *Hypogynous disc* annular or cup-shaped, often shallowly 5-lobed, sometimes obsolete. *Ovary* superior, of 2 (rarely 3) united carpels, 2(3)-loculed, sometimes only 1-chambered or by development of spurious septa 4-celled, occasionally 2- or 4-partite; ovules 2 in each carpel, rarely solitary, erect, anatropous, sessile; style terminal or rarely gynobasic, filiform, simple or \pm deeply 2-fid, or styles 2, very rarely 3, equal or subequal, rarely reduced; stigma entire or bilobed, rarely 3-lobed, or stigmas 2 (rarely 3 or 4), globose, ellipsoid, filiform or flattened, elliptic to linear, rarely peltate. *Fruit* 1-3-celled or spuriously 4-celled, mostly a capsule, usually dehiscent by valves or indehiscent; pericarp membranous, leathery or woody. *Seeds* 4, fewer by abortion, becoming triquetrous on inner face by mutual pressure, convex on back, glabrous or hairy (especially on angles), sometimes verrucose; embryo straight; radicle directed towards hilum; cotyledons foliaceous, generally folded or spirally coiled, sometimes small or 0 (in *Cuscuta*); endosperm scanty to fairly copious, situated between cotyledons.

The family comprises between 50 and 60 genera and between 1 500 and 1 800 species worldwide. There are 16 genera and 114 indigenous and naturalised species in southern Africa.

- 1a Leaves reduced to minute scales or absent; flowers small, usually in clusters, often numerous; herbaceous twining parasites 1. ***Cuscuta*** (p. 3)
- 1b Leaves well developed, green:
 - 2a Ovary 2- or 4-lobed and fruit split into 2 or 4 lobes; styles 2 (sometimes connate below), inserted between lobes of ovary; small prostrate herbs with oblong or cordate to reniform leaves:

* Voorstraat 41, Egmond-aan-Zee, The Netherlands. From 1952-1960 of the former Botanical Research Institute, Pretoria, South Africa.

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3a Ovary 2-cleft with 2 ovules in each chamber; fruit 2-lobed 2. **Dichondra** (p. 16)

3b Ovary 4-cleft with 1 ovule in each chamber; fruit 4-lobed 3. **Falkia** (p. 19)

2b Ovary not deeply lobed; fruit not split into 2 or 4 lobes; style simple or, if styles 2, then terminal; plants of various habits:

4a Styles 2, free or \pm united at base:

 5a Styles forked; stigmas 4, linear or subclavate 4. **Evolvulus** (p. 22)

 5b Styles not forked; stigmas 2, peltate or capitate:

 6a Leaves glabrous to densely hirsute on both surfaces 5. **Seddera** (p. 25)

 6b Leaves greyish velvety pubescent above, densely coated with golden brown hairs beneath 6. **Bonamia** (p. 29)

4b Style 1; stigmas globose to linear:

 7a Pollen smooth or with folds or thickened ridges, but not spinulose:

 8a Stigmas filiform, terete or subclavate:

 9a Bracteoles small or narrow, usually \pm remote from calyx 8. **Convolvulus** (p. 35)

 9b Bracteoles large, \pm enclosing calyx as an involucre 9. **Calystegia** (p. 49)

 8b Stigmas globose, ovate, oblong or elliptic:

 10a Ovary 1-celled; stigmas ovate; sepals unequal; corolla whitish with purple centre 10. **Hewittia** (p. 52)

 10b Ovary 2-4-celled:

 11a Flowers in pedunculate, subglobose heads, usually blue; leaves cordate at base, entire or slightly lobed 7. **Jacquemontia** (p. 32)

 11b Flowers not in heads, but in cymes or dichasia, or solitary, white or yellow, often with dark centre; leaves usually lobed or dissected, sometimes auricled at base, rarely entire:

 12a Anthers at anthesis helically twisted; pollen tricolpate; leaves usually palmately or pinnately compound 11. **Merremia** (p. 55)

 12b Anthers at anthesis straight; pollen pantoporate; leaves oblong to linear-lanceolate, much longer than broad, with hastate, sagittate or truncate base 12. **Xenostegia** (p. 63)

7b Pollen spinulose:

 13a Plants covered in all parts, except corolla, with stellate hairs; stigmas oblong 13. **Astripomoea** (p. 66)

 13b Plants glabrous to densely hairy, but never with stellate hairs; stigmas biglobose or 3-lobed:

 14a Fruit completely enclosed by the much enlarged calyx; pericarp thin, opening irregularly; seeds 4; leaves with dense black glandular dots on lower surface 16. **Stictocardia** (p. 124)

 14b Fruit dehiscent or indehiscent, not as above; leaves without black glandular dots below:

 15a Stamens inserted directly on corolla tube; style not completely caducous in fruit 14. **Ipomoea** (p. 70)

 15b Stamens inserted on scales situated near base of corolla tube; style completely caducous in fruit 15. **Paralepistemon** (p. 121)

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1. CUSCUTA

Cuscuta L., Species plantarum, 1st edn: 124 (1753); L.: 60 (1754); Baker & C.H.Wright: 83 (1904); Baker & Rendle: 202 (1905–06); Yunck.: 113 (1932); E.Phillips: 620 (1951); A.Meeuse: 644 (1957a); Verdc.: 3 (1963a); Roessler: 1 (1967a); R.A.Dyer: 501 (1975); Gonç.: 130 (1987); Gonç.: 3 (1990); Lejoly & Lisowski: 1 (1993a); Gonç.: 5 (1995). Type species: *C. europaea* L.

Parasitic, usually glabrous herbs, after seedling stage rootless and without chlorophyll, annual or rarely perennial in tissues of host. *Stems* usually terete and slender to filiform, often whitish, yellowish or reddish, twining or rambling, attached to host by means of numerous haustoria. *Leaves* reduced to minute scales or absent. *Flowers* small, in cymose clusters, sometimes paniculate, generally 5-merous but sometimes 3- or 4-merous. *Calyx* 5-lobed, 5-parted or sepals free; lobes or sepals broad or narrow, rounded or obtuse to very acute. *Corolla* with tubular, urceolate, campanulate or semiglobose tube; lobes shorter or longer than tube, often patent to reflexed; tube inside usually with crenulate or fimbriate epipetalous membranous scales, rarely scales reduced to crenulate rims or absent. *Stamens* inserted on corolla above scales; filaments often short; anthers often broadly elliptic; pollen smooth. *Ovary* 2-celled, 4-ovuled; styles 2, distinct, or connate and style 1; stigmas capitate or elongate. *Fruit* an ovoid or subglobose capsule, opening irregularly, or circumscissile near base or indehiscent. *Seeds* 4 or fewer, almost invariably glabrous; embryo acotyledonous, straight, filiform, enlarged at one end.

A genus of about 140 species distributed throughout the world, some of which spread through commerce and became noxious weeds on crops like clover, lucerne and flax. Species of *Cuscuta* may be restricted to a single host (monophagous ones), several to a few hosts or a group of hosts and a small number are polyphagous (such as *C. campestris*). Fifteen species occur in southern Africa, eight of which are endemic and three naturalised.

Some authors, e.g. Gonçalves (1987: 130), consider *Cuscuta* to constitute a separate monogenic family, but apart from its parasitic way of life there is not a single character to exclude it from the Convolvulaceae—some Convolvulaceae also have scales below the stamens and the fruits and seeds in *Cuscuta* are quite typically convolvulaceous.

1a Styles united almost to apex into a single column 8. *C. cassytoides*
 1b Styles 2, free to base or nearly so:
 2a Stigmas capitate-globose or ± peltate:
 3a Stigmas (in dried specimens) ± peltate with convolute edges; styles shorter than ovary; intrastylar aperture of capsule large; flowers 4–5 mm long and broad; calyx and corolla lobes broad, obtuse or rounded 6. *C. kilimanjari*
 3b Stigmas usually globose, more rarely somewhat flattened:
 4a Fringed scales in corolla tube below stamens absent 7. *C. hyalina*
 4b Fringed scales in corolla tube below stamens present (scales very rarely subentire):
 5a Scales in corolla tube bifid at apex:
 6a Flowers normally 5-merous, subsessile, in globose clusters; corolla lobes ovate to suborbicular, usually shorter than tube; scales ± bilobed at apex, usually not reaching base of free portion of filament 1. *C. australis*
 6b Flowers usually 4-merous, pedicellate, in ± umbellate cymes; corolla lobes narrow, usually distinctly longer than tube; scales bifurcate, terminal lobes exserted beyond sinuses of corolla tube, deeply fringed 2. *C. bifurcata*
 5b Scales in corolla tube free, not bifid at apex:

7a Scales usually not reaching base of free part of filaments; lobes of calyx and corolla (sub)acute; calyx narrowed at base, without warts or processes at base; corolla tube campanulate, longer than wide 4. *C. suaveolens**
 7b Scales mostly reaching base of free part of filaments, or, if not reaching filaments, then lobes of calyx and corolla very obtuse:
 8a Flowers in loose paniculate cymose clusters, pedicellate, slightly longer than wide; pedicels not infrequently longer than flowers, often papillose and rather rough; calyx shorter than corolla tube (in older flowers at least), usually very loose about base of corolla to almost spreading, with wart-like or saccate processes at base; styles usually longer than ovary 5. *C. appendiculata*
 8b Flowers in usually dense clusters, usually sessile or nearly so, wider than long or \pm as wide as long, \pm rounded at base; calyx nearly enclosing corolla tube, not very loosely about base and without wart-like or saccate basal processes; styles shorter than or nearly equalling ovary:
 9a Scales not reaching base of filaments, oblong, variously fimbriate to almost entire; corolla lobes broad, obtuse or rounded, ovate to suborbicular, erect 1. *C. australis*
 9b Scales usually reaching base of filaments, ovate, abundantly fringed with fairly long processes; corolla lobes broadly triangular, acute with often inflexed tips, rarely obtuse, usually spreading 3. *C. campestris**
 2b Stigmas conical to clavate or filiform, usually much longer than wide:
 10a Calyx as long as corolla tube, protruding at sinuses between calyx lobes to form prominent wings, 5-angled 13. *C. angulata*
 10b Calyx not 5-angled by protruding wings:
 11a Flowers 4-merous in small, dense, sessile globose clusters; corolla lobes erect, acute; stigmas longer than very short styles; scales in corolla tube entire or bifid, fringes distinctly thickened at apices 14a. *C. planiflora* var. *planiflora*
 11b Flowers 5-merous, or if 4-merous, then corolla lobes obtuse or style not very short:
 12a Stigmas and often also styles shorter than ovary (if stigmas \pm as long as ovary, then styles longer than stigmas); stigma usually considerably shorter than style:
 13a Corolla lobes with cucullate apices; flowers \pm 2 mm long; stigmas conical, sausage-shaped to subclavate, much shorter than styles 9. *C. gerrardii*
 13b Corolla lobes often with inflexed or reflexed tips, but never cucullate; flowers longer than 2 mm; stigmas various:
 14a Flowers sessile, in few-flowered dense clusters; styles shorter than ovary; lobes of calyx and corolla obtuse 14b. *C. planiflora* var. *madagascarensis*
 14b Flowers pedicellate; styles as long as or longer than ovary; lobes of calyx and corolla acute or obtuse:
 15a Calyx \pm as long as corolla tube; stigma \pm as long as style 12. *C. nitida*
 15b Calyx usually distinctly shorter than corolla tube; if calyx \pm as long as corolla tube, then stigmas considerably shorter than styles:
 16a Flowers usually 3–4 mm long; corolla lobes acute or obtuse; scales \pm reaching base of filaments; styles distinctly longer than stigmas 10. *C. africana*
 16b Flowers 4–7 mm long; corolla lobes very acute, often with reflexed tips; scales not reaching base of filaments; styles \pm as long as stigmas 11. *C. natalensis*
 12b Stigmas and styles both longer than ovary; stigma filiform, as long as or longer than style:

17a Calyx considerably shorter than corolla tube; flowers pale, whitish, pedicellate, 4–7 mm long 11. *C. natalensis*

17b Calyx not considerably shorter than corolla tube (in some forms of *C. epithymum* calyx distinctly shorter than corolla tube, but if so, then stems very slender, capillary, and flowers ± 3 mm long, sessile in dense globose clusters, often reddish):

18a Flowers somewhat fleshy, 3–5 mm long, in loose cymose clusters; scales usually reaching base of filaments; stems medium 12. *C. nitida*

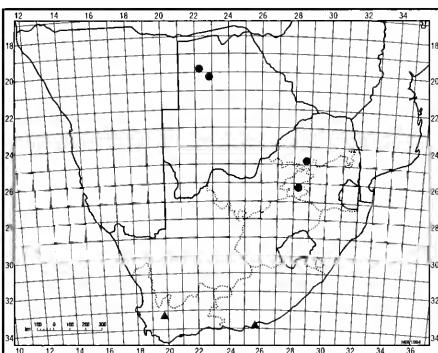
18b Flowers more herbaceous, ± 3 mm long, sessile, in dense, compact, globose clusters; scales usually not reaching base of filaments; stems very slender, capillary 15. *C. epithymum**

1. ***Cuscuta australis* R.Br.**, Prodromus florae novae hollandiae ...: 491 (1810); Yunck.: 124, fig. 1 (1932); Ooststr.: 66 (1938); Verdc.: 85 (1953); Ooststr.: 392 (1953); A.Meeuse: 647 (1957a); Verdc.: 4 (1963a); Gonç.: 130 (1987); Lejoly & Lisowski: 2 (1993a); Retief & P.P.J.Herman: 381 (1997). Type: Australia, Broadsound, *R. Brown* 2789 (BM, holo.; G, K, MO).

C. obtusiflora Humb., Bonpl. & Kunth var. *cordofana* Engelm.: 493 (1859). Type: Sudan, Kordofan, *Figari* s.n. (Fl., holo.; MO).

Stems medium, yellowish. Flowers often somewhat glandular, 2–3 mm long, subsessile, in loose to dense subglobose clusters. Calyx ± as long as corolla tube; lobes broad, ovate to suborbicular, apex rounded. Corolla campanulate; lobes shorter than or as long as tube, erect to somewhat spreading, broad, apex rounded. Stamens shorter than corolla lobes; filaments usually stout, ± subulate and often shorter than (sometimes ± as long as) broadly elliptic to suborbicular anthers. Scales oblong, shorter than tube, bifid or bilobed to entire, variously fimbriate. Ovary globose; styles shorter than ovary, intrastylar aperture 1.0–1.5 mm long. Capsule globose or somewhat ovoid, not dehiscent by circumscission, drying reddish brown. Seeds ellipsoid to ovoid, 1.25–2.0 mm long. Flowering time August to April.

Found throughout the Old World, from southern Europe to Japan and Australia, widespread from West Africa to the Sudan and southwards to southern Africa (Botswana, the Northern Province and Gauteng). Also in Madagascar. Recorded mostly on swamp vege-



MAP 1.—● *Cuscuta australis*
▲ *C. bifurcata*

tation such as species of *Centella*, *Glinus*, *Hydrocotyle*, *Leersia*, *Nymphaea*, *Papyrus* and *Polygonum*. Map 1.

This species forms part of a cosmopolitan aggregate. It also resembles *C. campestris* (no. 3), so that some Old World records of *C. campestris* could actually refer to variants of the *C. australis* complex. It can, however, be recognised by its rather reduced scales and the shape and proportion of its flower parts.

Vouchers: *Galpin* 11622 (BOL, PRE); *Smith* 1454 (K, PRE, SRGH).

2. ***Cuscuta bifurcata* Yunck.** in Memoirs of the Torrey Botanical Club 18: 131, fig. 7 (1932); A.Meeuse: 648 (1957a). Type: Eastern Cape,

Port Elizabeth, Paterson 578 (K, holo.; GRA!, PRE!).

Stems medium, yellowish. *Flowers* 2.0–2.5 mm long, glandular, usually 4-merous, in few-flowered umbellate cymes on short pedicels. *Calyx* almost equalling corolla tube; lobes oblong to lanceolate, obtuse or subobtuse with rounded sinuses between them. *Corolla* divided \pm halfway down; tube broadly campanulate; lobes acute or subacute to obtuse, erect to spreading, lanceolate-oblong. *Stamens* shorter than corolla lobes or subequal to them; anthers shorter than filaments. *Scales* bifurcate at apex, adnate to sinus between apical lobes, latter exserted between corolla lobes. *Ovary* globose; styles slender, shorter than or nearly equaling ovary. *Capsule* depressed-globose, not dehiscent by circumscission. *Seeds* \pm 2 mm long, subglobose, flattened on two sides, slightly attenuate on one end; hilum short, oblong, oblique. *Flowering time* January to April.

Endemic in the Western and Eastern Cape; very rare and not collected recently. Parasitic on species of *Falkia* and *Ursinia*. Map 1.

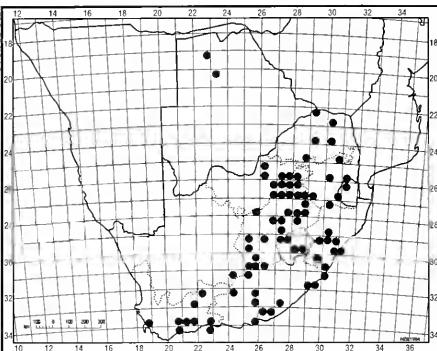
This species is notable for its long pedicels, loose inflorescence, narrow corolla lobes and slender styles.

Voucher: Schlechter 10110 (BOL, GRA, PRE).

3. ****Cuscuta campestris* Yunck.** in Memoirs of the Torrey Botanical Club 18: 138, fig. 14 (1932); A.Meeuse: 648 (1957a); Heine: 336 (1963); Verdc.: 5 (1963a); Compton: 473 (1976); Gonç.: 131, t. 34 (1987); Gonç.: 4, t. 1 (1990); Lejoly & Lisowski: 3, fig. 1 (1993a); Retief & P.P.J.Herman: 381 (1997). Type: U.S.A., Texas, Lindheimer 126 (MO, holo.).

C. arvensis sensu auct., non Beyr.

Stems medium, yellowish. *Flowers* 2–3 mm long, occasionally longer, often glandular, subsessile or on short pedicels in compact, globose clusters, greenish yellow. *Calyx* enclosing corolla tube or nearly so, broadly campanulate; lobes ovate to orbicular or broadly triangular,



MAP 2.—*Cuscuta campestris*

usually obtuse to rounded. *Corolla* with campanulate tube; lobes broadly triangular to ovate, spreading, with often inflexed tips, usually acute. *Stamens* shorter than corolla lobes; filaments longer than or equaling anthers. *Scales* ovate, elliptic or obovate, often exserted between corolla lobes, free at apex, usually abundantly fringed. *Ovary* globose; styles often subequal, slender, becoming thicker and conspicuous in fruit. *Capsule* depressed-globose, with a depression around style bases, 2.0–2.5 mm high, 3–4 mm wide, not circumscissile. *Seeds* \pm 1.5 mm long, usually flattened on one side; hilum terminal, oblong, transverse. *Flowering time* October to May.

An American species widely naturalised in the Old World. A 'declared weed' (Henderson *et al.* 1987), very common and troublesome throughout most of southern Africa, but absent from Namibia and most of the Northern Cape, and recorded on a wide range of hosts, such as woody and herbaceous dicotyledons, grasses and ferns; quite often as a pest on lucerne and other cultivated plants. Collected in the FSA area since 1907. Map 2.

Known by its prominently fringed scales and usually spreading corolla lobes.

Vouchers: Louw 1353 (PRE); Mogg 6768 (PRE); Nel 4 (PRE); Smith 396 (K, PRE, SRGH).

4. **Cuscuta suaveolens* Ser. in Annales des Sciences Physiques et Naturelles, d' Agriculture et de l'Industrie ... 3: 519 (1840); Yunck.: 148, fig. 22 (1932); Ooststr.: 167, fig. 2 (1942); A.Meeuse: 648 (1957a); Verdc.: 5 (1963a); Gonç.: 131 (1987); Retief & P.P.J.Herman: 382 (1997). Type: France, cultivated at Lyons, seeds probably from Chile, Vial s.n. (extant?).

C. medicaginis C.H.Wright: 86 (1904). Type: Eastern Cape, Queenstown, Galpin 1760 (GRA, PRE!, iso.).

Stems slender to medium, yellowish. Flowers 3–4 mm long, in loose racemose clusters on short pedicels, ± glandular, membranous when dry. Calyx shorter than corolla tube, lobed to ± halfway down; lobes ovate-triangular, ± acute, often with revolute edges, separated by usually rounded sinuses. Corolla long-campanulate to funnel-shaped; lobes ovate-triangular, with acute, inflexed tips, ± half to three-quarters as long as tube. Stamens shorter than corolla tube; filaments ± as long as anthers. Scales usually not reaching stamens, oblong to ovate or triangular-ovate, free at apex, fringed with rather short processes. Ovary globose; styles slender, often distinctly unequal, almost as long as ovary. Capsule globose, not circumscissile. Seeds 2–4, 1.5–2.0 mm long, subglobose; hilum oblong, longitudinal. Flowering time January and February.

A South American species which, as a contaminant of *Medicago sativa* (lucerne), has now

become widespread and almost cosmopolitan. A variety of plants can act as hosts, but in southern Africa it is found almost exclusively on lucerne. Recorded from Gauteng, Mpumalanga and the Eastern Cape. Map 3.

Easily distinguished by its large yellow flowers borne in clusters and its revolute calyx lobes.

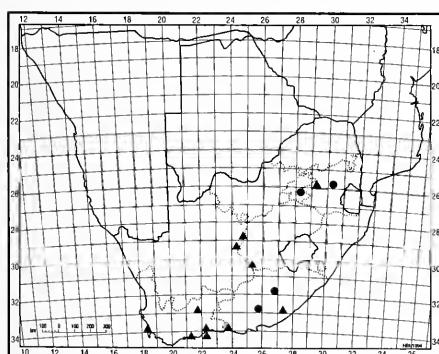
Vouchers: *Galpin* 7781 (GRA, PRE); *Rattray* 830 (PRE).

5. *Cuscuta appendiculata* Engelm. in Transactions of the Academy of Science of St Louis 1: 503 (1859); Baker & C.H.Wright: 86 (1904); Yunck.: 152, fig. 26 (1932); T.M.Salter: 687 (1950); A.Meeuse: 649 (1957a); Retief & P.P.J.Herman: 381 (1997). Type: Western Cape, Swellendam, Krauss 1816 (BM, holo.?).

C. appendiculata Engelm. var. *macroflora* Yunck.: 153 (1932). Type: Eastern Cape, Bedford, Bennie 250 (GRA, holo.).

Stems slender to medium, yellowish. Flowers 1.5–4.0 mm long, ± glandular, particularly calyx, in loose, paniculate, cymose clusters. Pedicels shorter to longer than flowers, papillose or verrucose. Bracteoles often papillose-verrucose and saccate at base by wart-like projections. Calyx shorter than corolla tube; tube verrucose towards base and with wart-like basal processes; lobes triangular, acute. Corolla campanulate; lobes nearly as long as tube, erect to spreading, oblong- or ovate-lanceolate, acute to acuminate, with inflexed tips. Stamens shorter than corolla lobes; filaments ± as long as anthers. Scales oblong-ovate or obovate, much fimbriated, ± equaling corolla tube. Ovary globose; styles slender, equaling ovary or slightly longer, often somewhat unequal. Capsule ovoid or globose, somewhat contracted and roughened around style bases, not circumscissile. Seeds subglobose, somewhat flattened, ± 1.5 mm long; hilum oblong, longitudinal. Flowering time October to March.

Fairly rare endemic species in Mpumalanga, the Free State, Northern, Western and Eastern Cape,



MAP 3.—● *Cuscuta suaveolens*
▲ *C. appendiculata*

which grows on a large number of hosts such as species of *Combretum*, *Falkia*, *Hermannia*, *Lycium*, *Pelargonium*, *Thesium*, members of the Asteraceae and Campanulaceae, *Nicotiana glauca* and *Sporobolus pungens*. Map 3.

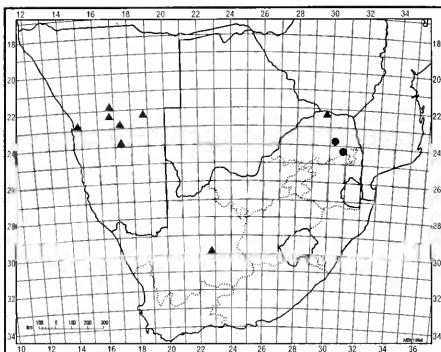
Distinguished by the wart-like appendiculations on the calyx and the papillose or verrucose pedicels.

Vouchers: *Muir* 1281 (PRE); *Schlechter* 3811 (BOL, GRA, NH, PRE).

6. *Cuscuta kilimanjari* Oliv. in Johnston, Narrative of the Kilimanjaro Expedition Appendix: 343 (1886), nom. tant.; Oliv.: 343 (1887); Baker & Rendle: 205 (1905–06); Yunck.: 187, fig. 58 (1932); Verde.: 85, fig. 1 (1953); A.Meeuse: 650 (1957a); Verde.: 6 (1963a); Gonç.: 133 (1987); Gonç.: 5 (1990); Lejoly & Lisowski: 4, fig. 2 (1993a); Retief & P.P.J.Herman: 382 (1997). Type: Tanzania, Kilimanjaro, *H.H. Johnston* 86 (K, holo.).

Stems of medium thickness to rather stout, yellowish to orange. Flowers 4–6 mm long, wide, pale cream-coloured, in few-flowered cymes on pedicels shorter than flowers, somewhat coriaceous when dried. Calyx cupulate; lobes ovate-orbicular, obtuse, overlapping at base, rather thick and often ± carinate. Corolla campanulate-cylindric; tube longer than ovate-orbicular, obtuse to rounded and often somewhat revolute lobes. Stamens shorter than corolla lobes; filaments ± as long as anthers. Scales triangular or oblong, apex often truncate, edge irregularly and unevenly fringed to almost entire, usually reaching bases of stamens, but sometimes smaller or reduced. Ovary globose; stigmas shorter than ovary, often flattened with convolute edges. Capsule globose, intrastylar aperture large, irregularly circumscissile near base. Seeds 2–4, ovoid, 1.5–3.0 mm long, somewhat attenuate at base, pale yellow-brown or blackish when dry; hilum oblong. Flowering time January to September.

This taxon occurs throughout eastern Africa, from Ethiopia southwards and southwestwards



MAP 4.—● *Cuscuta kilimanjari*
▲ *C. hyalina*

to the eastern part of the Democratic Republic of the Congo, Zimbabwe, South Africa (the Northern Province) and Mozambique, usually above 1000 m. Parasitic on various hosts, often shrubby, but predominantly on herbaceous Acanthaceae on the floor and edges of lowland and upland rain forests, bamboo and riverine forests. Map 4.

The plants described above belong to the var. *kilimanjari*. This species is easily recognised by its large flowers; in herbarium specimens the anthers have a pale cream-colour contrasting with the dark brown of the rest of the flower.

Vouchers: *Scheepers* 647 (PRE); *Taylor* 658 (PRE).

7. *Cuscuta hyalina* Roth, Novae plantarum species praesertim Indiae orientalis: 100 (1821); Baker & Rendle: 205 (1905–06); Yunck.: 235, fig. 107 (1932); Verde.: 85 (1953); A.Meeuse: 650 (1957a); Verde.: 8 (1963a); Roessler: 1 (1967b); Gonç.: 133 (1987); Lejoly & Lisowski: 6 (1993a); Retief & P.P.J.Herman: 381 (1997). Type: India 'orientale', *Heyne* s.n. (B, hol.†; K).

C. epitrifolium Schinz: 880 (1901); Baker & Rendle: 206 (1905–06). Type: Namibia, Okomita, *Dinter* 506 (Z, holo.).

Stems usually very slender, yellowish. Flowers 2.5–3.5 mm long, in umbellate cymes

on short pedicels, thin in texture, 5- or sometimes 4-merous, shining and yellowish when dry. *Calyx* campanulate-turbinate; triangular or ovate-lanceolate lobes very acute to acuminate, longer than or \pm as long as tube, erect to reflexed. *Corolla* campanulate; lobes narrow and very acute, erect or spreading, usually longer than tube. *Stamens* shorter than corolla lobes; anthers as long as or shorter than filaments. *Scales* none. *Ovary* globose; styles slender, as long as or longer than ovary, subequal. *Capsule* globose, irregularly circumscissile near base. *Seeds* ovoid, \pm 1.5 mm long; hilum short. *Flowering time* December to March.

This species occurs from India to Ethiopia and the Sudan, extending towards the drier areas of Namibia, the Northern Province and Northern Cape in southern Africa. Map 4.

Apparently prefers open vegetation in rather dry country where it usually grows on species of *Trianthema* and *Tribulus*. Notable for the absence of infrastaminal scales inside the flowers.

Vouchers: *Bryant* 357 (PRE); *Merxmüller* 1220 (M, PRE, WIND).

8. *Cuscuta cassyoides* Engelm. in Transactions of the Academy of Science of St Louis 1: 513 (1859); Baker & C.H. Wright: 86 (1904); Baker & Rendle: 206 (1905-06); J.M. Wood: t. 534 (1912); Yunck.: 250, fig. 123 (1932); Verdc.: 85 (1953); A. Meeuse: 651 (1957a); Verdc.: 8 (1963a); Compton: 473 (1976); Gonç.: 134 (1987); Gonç.: 6 (1990); Lejoly & Lisowski: 8 (1993a); Retief & P.P.J. Herman: 381 (1997). Type: Eastern Cape, Uitenhage, *Drège* 8037 (MO, holo.; K, L).

C. timorensis Engelm.: 514 (1859). Type: Timor, *Leschenault* s.n. (P, holo.).

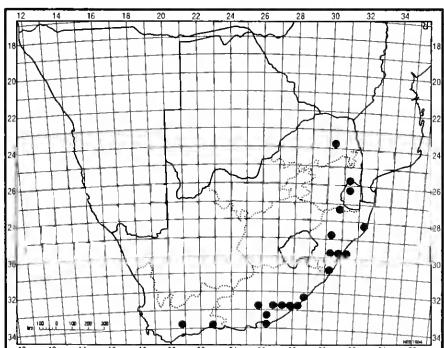
Stems coarse, 0.5-2.5 mm in diameter, yellow-green and often with purple or brown spots. *Flowers* subsessile, 2.5-4.0 mm long, yellowish, drying dark brown, arranged in few-flowered clusters in paniculate spikes, or inflorescence reduced to a single short raceme. *Calyx* cupulate, almost as long as corolla tube; lobes

broadly ovate to orbicular, broadly rounded, overlapping, with \pm unequal edges. *Corolla* campanulate; lobes as long as tube, ovate, obtuse to rounded, erect to reflexed. *Stamens* subsessile, shorter than corolla lobes; filaments much shorter than anthers. *Scales* triangular, adnate to tube over most of their surface, with small free lateral fringed portions, sometimes much reduced. *Ovary* globose-conical; styles united into a single column \pm 0.5-1.5 mm long; stigmas small, flat. *Capsule* globose-ovoid to ovoid-oblong, circumscissile near base, 5-8 mm long; styles persistent. *Seeds* up to 4, subglobose, \pm 3 mm long, hilum long, narrow, terminal. *Flowering time* February to October.

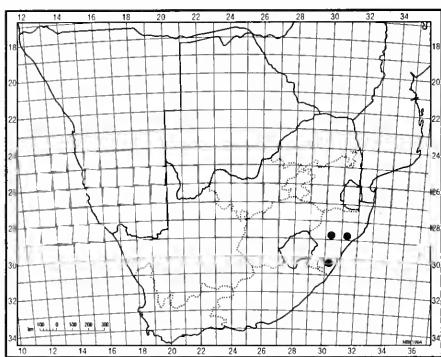
Cuscuta cassyoides occurs in the East Indies and also in Africa, from Ethiopia to southern Africa where it is found in the eastern parts in the Northern Province, Mpumalanga, Swaziland, KwaZulu-Natal, and the Western and Eastern Cape. This species has been described as a weed, e.g. on species of *Coffea* and is parasitic mostly on woody plants such as species of *Ficus*, *Grewia*, *Trema* in forests and thickets, often in coastal bush, up to 1 850 m. It is also found on herbs such as species of *Leucas* and *Plumbago*. Map 5.

Distinguished by the single column of the two united styles.

Vouchers: *Archibald* 5516 (PRE); *Dlamini* s.n. (PRE); *Galpin* 949 (PRE); *Killick* 336 (PRE).



MAP 5.—*Cuscuta cassyoides*

MAP 6.—*Cuscuta gerrardii*

9. *Cuscuta gerrardii* Baker, Flora capensis 4,2: 84 (1904); Yunck.: 264, fig. 133 (1932); A.Meeuse: 652 (1957a). Type: KwaZulu-Natal, Zululand, *Gerrard* 1337 (K, holo.); *Gerrard & McKen* 1337 (NH, iso.!).

C. cucullata Yunck.: 263, fig. 132 (1932). Type: KwaZulu-Natal, Umnzinto, Dumisa, *Rudatis* 827 (PRE, iso.!).

Stems slender to medium, yellowish. Flowers \pm 2 mm long, in loose clusters, \pm glandular, on short pedicels. Calyx shorter than corolla tube or \pm as long, \pm thickened at basal part; lobes ovate, obtuse or almost acute, often loose about corolla. Corolla campanulate; lobes erect to slightly spreading, ovate to \pm triangular, acute, inflexed with cucullate tips, \pm as long as, or longer than tube. Stamens slightly shorter than corolla lobes; filaments somewhat subulate, longer than or almost as long as oval anthers. Scales oblong or ovate, usually truncate or rounded at apex, not deeply fimbriate; adnate below middle. Ovary globose, somewhat depressed and slightly but distinctly attenuate into a short, thickened base; styles shorter to slightly longer than ovary, often divergent; stigmas conical or sausage-shaped to oblong, much shorter than styles. Capsule globose or depressed-globose, not circumscissile; styles divergent, intrastylar opening large. Seeds 1 or 2, black, finely tuberculate or rugose; hilum small, inconspicuous, nearly basal. Flowering time January to April.

This rare species is endemic to KwaZulu-Natal. *Cuscuta gerrardii* has been found on several unidentified herbs and shrublets. Map 6.

Recognised by its 2 mm long flowers with cucullate corolla lobe apices.

Vouchers: *Haygarth* sub NH12988 (NH, PRE); *Lawn* 1535 (NH); *Wylie* sub *Wood* 8761 (NH, PRE).

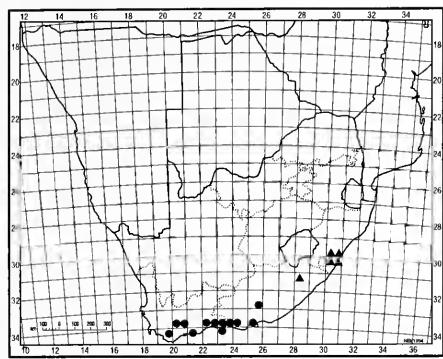
10. *Cuscuta africana* Willd., Species plantarum: 703 (1797); Thunb.: 568 (1823); Baker & C.H.Wright: 85 (1904); Yunck.: 264, fig. 134 (1932); Marloth: 108 (1932); A.Meeuse: 652 (1957a). Type: Cape, *Thunberg* s.n. (UPS, holo.); *Willdenow* 3161 (B, iso.†).

C. capensis Choisy: 454 (1845). Type: Cape, George, Kaymans Gat, *Drege* 7833 (L, PRE!, iso.).

C. alpestris Fourc.: 89 (1934). Type: Cape, Wagenboom River, *Fourcade* 2389 (BOL, holo.; PRE!).

Stems medium to thick, yellowish. Flowers on pedicels shorter to longer than flowers, in loose to compact clusters. Calyx usually distinctly shorter than corolla tube; lobes triangular-ovate, obtuse to subacute. Corolla campanulate-funnel-shaped; lobes triangular, spreading or reflexed, sometimes suberect, acute or obtuse, usually \pm as long as tube. Stamens shorter than corolla lobes; filaments longer than anthers. Scales \pm reaching stamens or longer, oblong, with rather small fringes, free at apex. Ovary globose; styles slender, longer than ovary and also longer than thickened oblong-cylindrical stigmas. Capsule globose, irregularly circumscissile near base. Seeds subglobose; hilum terminal, narrow. Flowering time August to December.

This species is endemic to the Western and Eastern Cape, from about *Riviersonderend* to around *Somerset East*. The hosts of *Cuscuta africana* are mainly woody fynbos plants such as *Laurophylloides capensis*, species of *Berzelia*, *Clutia*, *Geissoloma*, *Myrica*, *Phyllica*, *Protea*, *Ursinia*, *Virgilia*. According to Marloth (1932: 108), *C. africana* is a perennial that hibernates inside the bark of the host, but this needs confirmation (see *C. nitida*, no. 12). Map 7.



MAP 7.—● *Cuscuta africana*
▲ *C. natalensis*

Distinguished by its 3–4 mm long flowers with styles distinctly longer than the stigmas.

Vouchers: *Keet 1009* (BOL, GRA, PRE); *Long 396* (PRE); *Marloth 8644* (PRE); *Muir 156* (BOL, GRA, PRE); *Zeyher 3447* (PRE, SAM).

11. *Cuscuta natalensis* Baker, Flora capensis 4,2: 85 (1904); Yunck.: 266, fig. 135 (1932); A.Meeuse: 653 (1957a). Type: Kwa-Zulu-Natal, Inanda, Wood 596 (K, holo.; BOL!, NH!, PRE!, SAM!).

Stems medium to thick, yellowish. Flowers 4–7 mm long, in cymose clusters on pedicels

shorter than flowers. Calyx much shorter than corolla tube; calyx lobes triangular-ovate, acute to subacute, tips often spreading. Corolla cylindrical-campanulate; lobes triangular-lanceolate, acute or acuminate, erect to spreading or reflexed, almost as long as tube. Stamens shorter than corolla lobes; filaments ± as long as anthers. Scales oblong, nearly reaching stamens or shorter, fringed with rather short processes, free at apex. Ovary globose; styles slender, ± as long as thickened cylindrical stigmas, both together considerably longer than ovary. Capsule globose, circumscissile near base, intrastylar opening large. Seeds 1.0–1.25 mm long, subglobose; hilum a short oblique line. Flowering time April to June. Figure 1.

This fairly rare endemic occurs in the eastern part of South Africa in KwaZulu-Natal and the Eastern Cape. It is parasitic on various shrubs, herbs and grasses in coastal and riverine scrub or forest. Map 7.

Distinguished by its 4–7 mm long flowers with long corolla tubes and with styles as long as the stigmas.

Vouchers: *Acocks 13789* (PRE); *Doidge sub PRE 11250* (PRE); *Pegler 1508* (GRA, PRE, SAM); *Rudatis 1666* (L, PRE).

12. *Cuscuta nitida* Choisy in Mémoires de la Société de Physique et d'Histoire Naturelle

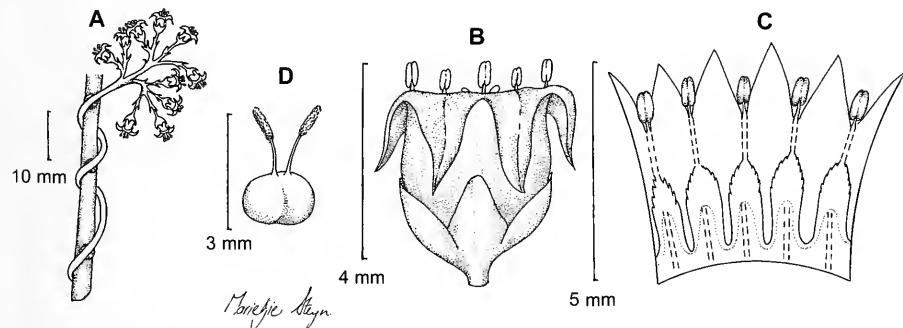
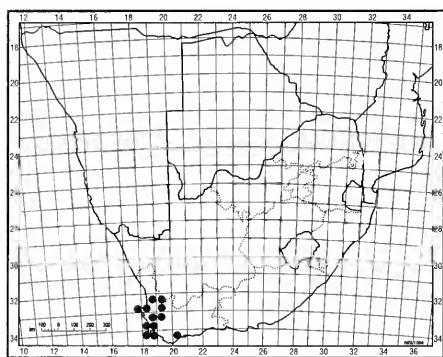


FIGURE 1.—*Cuscuta natalensis*: A, flowering stem (*Doidge s.n.*, PRE); B, flower; C, inside of corolla tube with stamens and scales; D, ovary, styles and stigmas (*Pegler 1508*, PRE). Artist: Marietjie Steyn.

MAP 8.—*Cuscuta nitida*

de Genève 9: 272, t. 2, fig. 1 (1842); Choisy: 454 (1845); Baker & C.H.Wright: 85 (1904); Yunck.: 266, fig. 136 (1932); T.M.Salter: 687 (1950); A.Meeuse: 654 (1957a). Type: Western Cape, Paarlberg, *Drège s.n.* (G, holo.; L!).

Stems medium, yellowish. *Flowers* white, becoming reddish, fragrant, in loose cymose clusters on short pedicels, often somewhat fleshy and granulate, 3–5 mm long. *Calyx* campanulate-turbinate, deep; lobes usually short, triangular, acute, but sometimes longer, lanceolate and if so, then longer than corolla tube. *Corolla* lobes spreading or reflexed, lanceolate or triangular-lanceolate, acute, as long as or longer than corolla tube. *Stamens* shorter than corolla lobes; filaments longer than anthers. *Scales* large, oblong, reaching stamens, fringed, free at apex. *Ovary* globose; styles \pm as long as oblong-cylindrical thickened stigmas, both usually longer than ovary. *Capsule* globose, depressed near style bases, circumscissile near base. *Seeds* \pm 1.5 mm long, ovoid-oblong or ovoid; hilum small, circular to oblong. *Flowering time* throughout the year, mostly November to January.

Cuscuta nitida is endemic to the Western Cape. This species is a parasite on fynbos vegetation and is found mostly on woody plants such as species of *Aspalathus*, *Montinia*, *Oftia*, *Passerina*, *Pelargonium*, *Phyllica*, *Rhus*, *Selago*, suffruticose members of the Asteraceae, Ericaceae and Proteaceae. Visser (1981: 78, 79,

155) has discussed this species in great detail. His Figure 120 clearly shows young shoots of *C. nitida* emerging through the bark of the host, proving beyond doubt that this species hibernates inside woody hosts. Therefore Marloth's statement that *C. africana* hibernates in this way, may be queried, as he could have confused the plants or the names (see Meeuse 1957a: 655). Map 8.

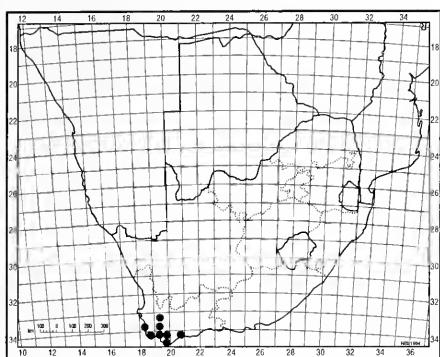
Distinguished by its 3–5 mm long, white to reddish flowers with short corolla tubes and with styles as long as the stigmas.

Vouchers: Marloth 4252 (PRE); Rogers 17342 (BOL, J, PRE); Schlechter 7271 (BOL, GRA, L, PRE, SAM, US); Smith 6036 (PRE); Young 207 (PRE).

13. *Cuscuta angulata* Engelm. in Transactions of the Academy of Science of St Louis 1: 474 (1859); Baker & C.H.Wright: 84 (1904); Marloth: 27 (1932); Yunck.: 267, fig. 137 (1932); T.M.Salter: 687 (1950); A.Meeuse: 655 (1957a). Type: Western Cape, Worcester, Dutoitskloof, *Drège s.n.* (MO, holo.; L!, PRE!).

C. falkiformis Schltr.: 449 (1897). Type: Western Cape, Houwhoek, Schlechter 7381 (G-BOIS, holo.).

Stems slender, yellowish. *Flowers* 3–4 mm long, often glandular, on pedicels longer to shorter than flowers, in loose fasciculate cymes; bracts often numerous on longer pedicels. *Calyx* as long as and enclosing corolla tube, protruding at sinuses between lobes to form prominent wings and widest about middle; lobes triangular, acute. *Corolla* lobes narrowly triangular to lanceolate, erect to spreading, longer than or equaling campanulate, \pm angular tube, which is usually angled opposite protruding calyx wings. *Stamens* shorter than lobes; filaments longer than anthers. *Scales* oblong-spathulate, fringed with processes of medium length, adnate near base and free for greater part of their length. *Ovary* globose or somewhat oblong; styles slender, longer than ovary, usually longer than oblong-cylindrical thickened styles. *Capsule* globose to oblong or pear-shaped, circumscissile near base. *Seeds* usually solitary, ovoid,

MAP 9.—*Cuscuta angulata*

hilum terminal. Flowering time September to February.

This species is endemic to the Western Cape. *Cuscuta angulata* is a parasite of mostly ericoid shrubs such as species of *Berzelia*, *Cliffortia*, *Passerina*, *Phyllica*, *Staavia* and members of the Ericaceae, Penaeaceae, Proteaceae, etc. Since most of these hosts are perennial shrubs, this dodder may also be perennial, hibernating inside the bark of the host (see *C. nitida*). Map 9.

This species is recognised by its markedly angular calyx.

Vouchers: *Bolus* 8580 (BOL, PRE, NBG); *Marloth* 4249 (PRE); *Pillans* 9470 (BOL, PRE, NBG); *Smith* 502 (PRE); *Stokoe* 9214 (BOL, PRE).

14. ***Cuscuta planiflora* Ten.** in *Flora napolitana ossia descrizione delle piante ...* 3: 250, t. 220, fig. 3 (1824–29); Baker & Rendle: 203 (1905–06); Yunck.: 292, fig. 157 (1932); Verde.: 9 (1963a); Roessler: 1 (1967b); Gonç.: 134 (1987); Lejoly & Lisowski: 9 (1993a); Retief & P.P.J. Herman: 382 (1997). Type: Italy, Naples, *Tenore s.n.* (MO, iso.).

Stems slender to medium, up to 0.3 mm wide, yellowish or crimson. Inflorescences ± compact clusters. Flowers up to 3 mm long, usually whitish, subsessile, somewhat fleshy.

Calyx almost enclosing corolla tube or shorter, broadly campanulate; lobes fleshy or turgid, obtuse or acute. Corolla campanulate-globose; lobes almost acute or slightly obtuse, membranous or turgid at apices, ± equaling tube or shorter, spreading. Scales usually oblong, almost reaching stamens or shorter, fringed, usually bifid, bridged low down or at middle. Stamens shorter than corolla lobes; filaments ± equaling or longer than anthers. Ovary globose; styles longer or shorter than stigmas, slender; stigmas slender. Capsule depressed-globose, markedly splitting around base. Seeds ovoid, granulate, mostly shorter than 1 mm.

Two varieties of this species complex occur in southern Africa:

Flowers small; calyx 1.5–3.5 mm wide; corolla 1.5–2.5 mm long; lobes abruptly acute; styles and stigmas together 0.5–1.0 mm long
 14a. var. *planiflora*
 Flowers larger; calyx 3–5 mm wide; corolla 2.0–3.5 mm long; lobes ± obtuse; styles and stigmas together 1.0–2.2 mm long
 14b. var. *madagascarensis*

14a. var. *planiflora*.

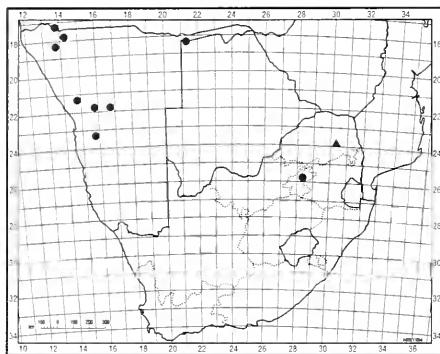
C. planiflora Ten. var. *mossamedensis* Hiern: 743 (1898); Baker & Rendle: 203 (1905–06); A. Meeuse: 655 (1957a). Type: Angola, Mossamedes, Welwitsch 6141 (BM, hol.; K, COI!).

C. balansae Boiss. & Reut. var. *mossamedensis* (Hiern) Yunck.: 291, fig. 154F & G (1932). Type as above.

C. pretoriana Yunck.: 133, fig. 2 (1957). Type: Gauteng, Pretoria, C.E. Moss 16852 (BM, hol.; JI, PRE!).

Flowers small. Calyx up to 3.5 mm wide when flattened out, almost enclosing corolla tube. Corolla ± 1.5–2.5 mm long; tube ± 1.5 mm long; lobes abruptly acute. Styles and stigmas ± equal or styles shorter than stigmas. Flowering time January to May.

Recorded from Namibia and Gauteng in South Africa, also in tropical and northern Africa, the Mediterranean and southwestern



MAP 10.—● *Cuscuta planiflora* var. *planiflora*
▲ *C. planiflora* var. *madagascarensis*

Asia. Parasitic on a great variety of herbaceous plants, including monocotyledons, species of *Barleria*, *Merremia* and the Fabaceae (especially *Indigofera*). Probably introduced but has been found in natural bushveld and grassland on granitic and sandy soils. Map 10.

Vouchers: *De Winter & Leistner* 5821 (M, PRE, WIND); *De Winter & Wiss* 4459 (M, PRE, WIND); *Dinter* 37 (PRE, SAM); *Giess, Volk & Bleissner* 5837 (M, PRE, WIND).

14b. var. **madagascarensis** (Yunck.) Verdc.: 337 (1957a), as *madagascariensis*; A.Meeuse: 656 (1957a); Verdc.: 10 (1963a); Retief & P.P.J.Herman: 382 (1997). Type: Madagascar, without locality, *Baron* 3466 (K, holo.).

C. madagascarensis Yunck.: 276, fig. 144 (1932).

C. madagascarensis Yunck. var. *schlechteri* Yunck.: 277 (1932) Type: KwaZulu-Natal, Hilton Road, *Schlechter* 6761 (BOL!, GRA!, iso.).

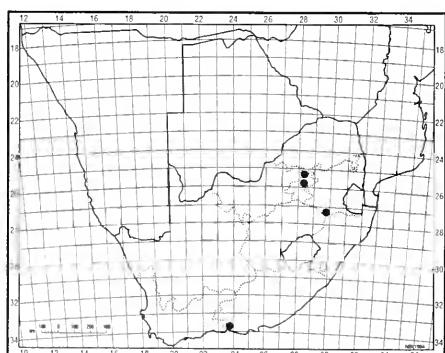
Stems medium. *Flowers* 4- or 5-merous. *Calyx* rather loose about corolla; lobes ovate, often somewhat fleshy at tips. *Corolla* membranous, campanulate; lobes erect, ovate. *Stamens*: filaments slightly longer than anthers. *Scales* ovate, oblong or spatulate, entire or somewhat bilobed, free at apex. *Ovary* subglobose: styles and stigmas erect, subequal. *Seeds* oblong; hilum short. *Flowering time* April.

Found in East Africa and Madagascar, also in the Northern Province in South Africa. Map 10.

Voucher: *Gerber* PRE5678 (PRE).

15. ****Cuscuta epithymum* Murray in L., *Systema vegetabilium* ..., 13th edn: 140 (1774); Yunck.: 283, fig. 151 (1932); A.Meeuse: 656 (1957a); Retief & P.P.J.Herman: 381 (1997). Type: if the Pinax (p. 219) of Bauhin (1671) is taken as the iconotype (Yunck. 1932: 283), there may be a specimen (prototype) in the Bauhin Herbarium in Basle, probably from Switzerland.**

Stems very slender, often reddish or purplish. *Flowers* ± 3 mm long, in dense many-flowered clusters, often reddish. *Calyx* usually ± as long as corolla tube; lobes triangular, acute. *Corolla*: lobes triangular, acute, spreading, shorter than tube. *Stamens* shorter than corolla lobes; filaments longer than anthers. *Scales* ± spatulate; shorter than corolla tube, fringed mainly in upper part, free at apex. *Ovary* globose; stigmas filiform, slightly longer than styles, together almost twice as long as ovary. *Capsule* globose, circumscissile near base. *Seeds* usually 4, ovoid, ± 1 mm long, rather rugose, angular, compressed, oblong, transverse, hilum short. *Flowering time* January to May.



MAP 11.—*Cuscuta epithymum*

A native of Europe, but spread with commerce throughout the world. Hosts: a great variety of herbaceous and shrubby plants, but outside its natural area of distribution chiefly on leguminous crops, e.g. *Medicago sativa*. Its establishment in a certain area seems to be the result of contaminated imported seed rather than the survival or dispersal of already established populations. It seems to be absent from hot and dry areas. In southern Africa this species has been recorded occasionally in Gauteng, Mpumalanga and the Eastern Cape, the first records dating from about 1894. Map 11.

Said to have medicinal properties (Watt & Breyer-Brandwijk 1962: 306). It does not

appear to be such a serious pest as *Cuscuta campestris* (no. 3).

Cuscuta epithymum is recognised by its 3 mm long sessile flowers in dense compact, globose clusters and scales usually not reaching the base of the filaments. There is a good deal of infraspecific variation, but no subdivision will be attempted here; southern African specimens seem to agree with the typical variety *epithymum*. Numerous synonyms are listed by Yuncker (1932: 283).

Vouchers: *Kretzmar* PRE10188 (PRE); *Laughton* PRE39610 (PRE); *Smith* 6215 (PRE); *Van Gass* PRE947 (PRE).

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2. DICHONDRA

Dichondra J.R. & G.Forst., Characteres generum plantarum ...: 39, t. 20 (1776); Baker & C.H.Wright: 83 (1904); E.Phillips: 621 (1951); A.Meeuse: 657 (1957a); Tharp & M.C.Johnst.: 347 (1961); Verdc.: 12 (1963a); R.A.Dyer: 501 (1975); Gonç.: 10 (1987); Gonç.: 5 (1992); Lejoly & Lisowski: 353 (1993b). Type species: *D. repens* J.R. & G.Forst.

Small, prostrate, glabrous or silky pubescent, perennial, creeping herbs. *Leaves* simple, petiolate, cordate-orbicular or reniform, entire. *Flowers* small to minute, solitary, axillary, pedicellate; bracteoles 2, minute, subulate. *Sepals* 5, ± free, scarcely joined at base, subequal, ovate-spathulate, somewhat accrescent. *Corolla* widely campanulate, deeply 5-lobed, not longer than calyx, hirsute outside; lobes induplicate-valvate. *Genitalia* included. *Stamens* 5; filaments filiform, shorter than corolla, inserted in corolla tube between lobes; anthers small, oblong to subglobose; pollen smooth. *Ovary* deeply 2-lobed; each lobe 1-celled, 2-ovuled, hairy; styles 2, free or connate below, gynobasic and inserted between lobes, short, filiform; stigmas capitate. *Capsule* 2-lobed; lobes erect, subglobose, membranous, 1- or rarely 2-seeded, indehiscent or irregularly 2-valved. *Seeds* subglobose or obovoid, 1(2) in each loculus, smooth with thin crustaceous testa; cotyledons linear-oblong or elliptic, ± spirally coiled or plicate; radicle curved, terete; endosperm scanty.

A small genus of 9 species, principally American, with one species widespread in the tropical and subtropical regions of both hemispheres; one species in southern Africa.

***Dichondra micrantha** Urb. in Symbolae Antillanae 9: 243 (1924). Type: Cuba, Oriente Province, Taco Bay, E.L. Ekman 3851a (S, holo.; B?, iso.).

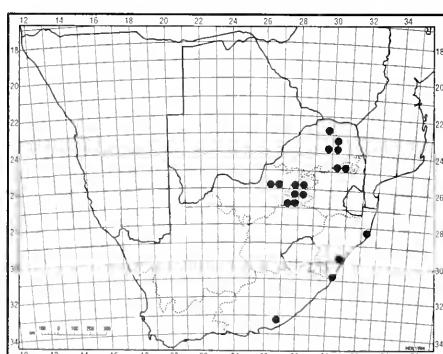
D. repens auctt., non J.R. & G.Forst.: 40, t. 20 (1776); Peter: 14 (1891); Hallier f.: 82 (1893a); Baker & C.H.Wright: 83 (1904); Baker & Rendle: 65 (1905-06); A.Meeuse: 657 (1957a); Heine: 338 (1963); Verdc.: 12, fig. 2 (1963a); Verde.: 159 (1978); Gonç.: 10, t. 1 (1987); Gonç.: 6, t. 1 (1992); Lejoly & Lisowski: 354, fig. 1 (1993b); Retief & P.P.J.Herman: 382 (1997).

Pubescent, procumbent herb. *Stems* up to 0.5 m long, shortly hairy, rooting at nodes. *Leaves* cordate-orbicular to reniform, 4-25 mm in diameter, base of lamina broadly cordate, apex broadly rounded or emarginate, ± 7-nerved at base, upper surface glabrescent, lower surface hairy; petiole hairy, 8-70 mm long. *Pedicels* hairy, 2-19 mm long. *Sepals* 2-3 mm long, hairy on back and margins. *Corolla* ± as long as calyx, greenish yellowish. *Capsule* 1.5-2.5 mm in diameter, pilose. *Seeds* subglobose, minutely granular, brown. *Flowering time* September to May. Figure 2.

Widespread and introduced in the warmer regions of both hemispheres. Also widespread

in the eastern parts of southern Africa, but probably often overlooked on account of its very small, inconspicuous flowers and its resemblance, when sterile, to species of *Centella* and *Hydrocotyle* (Apiaceae), which occur in similar habitats (moist places). Map 12.

Welman (1999a: 253) pointed out that the correct name for the *Dichondra* sp. in southern Africa is *D. micrantha* Urb., following Austin (1998: 88) who proved that the cosmopolitan



MAP 12.—*Dichondra micrantha*

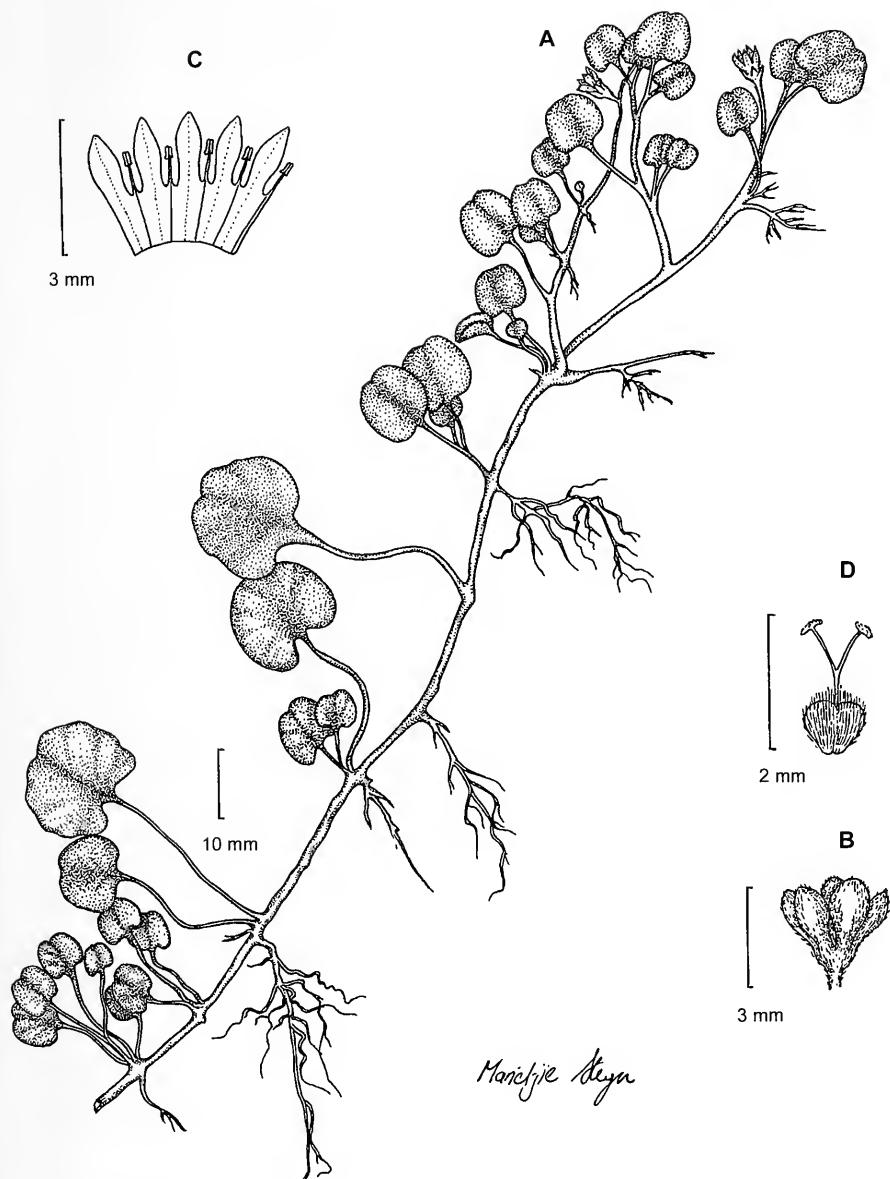


FIGURE 2.—*Dichondra micrantha*: A, flowering stem; B, calyx; C, inside of corolla tube with stamens; D, ovary, styles and stigmas (Behr 982, PRE). Artist: Marietjie Steyn.

weed and horticultural subject generally known as *D. repens* J.R. & G.Forst. is not that species, which is endemic to Australia, Tasmania and New Zealand. *D. micrantha*, probably originally from North America, has been cultivated and distributed by man for the past 200 years and now occurs almost worldwide. It is distinguished by its creeping habit and entire cordate-orbicular to reniform leaves with long petioles.

Recorded as a weed in grassland and cultivated areas. Often cultivated as a ground cover or soil binder: dewdrop lawn, kidney weed, wonder lawn.

Vouchers: *Archibald* 1781 (PRE); *Nicholson* 1633 (NH, PRE); *Prosser* 1627 (J, PRE); *Sutton* 699 (PRE).

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3. FALKIA

Falkia Thunb., Nova genera plantarum 1: 17 (1781), nom. & orth. cons.; L.f.: 211 (1782); Peter: 14 (1891); Hallier f.: 569 (1893b); Hallier f.: 84 (1893a); Baker & C.H.Wright: 81 (1904); Baker & Rendle: 65 (1905–06); E.Phillips: 621 (1951); A.Meeuse: 658 (1957a); Verdc.: 14 (1963a); Roessler: 6 (1967a); R.A.Dyer: 502 (1975); Gonç.: 12 (1987); Gonç.: 8 (1992); Lejoly & Lisowski: 355 (1993b). Type species: *F. repens* Thunb.

Slender, dwarf, prostrate, often matted, perennial herbs. *Leaves* simple, petiolate, ovate or cordate-orbicular to oblong-lanceolate, entire. *Flowers* small, solitary, axillary, pedicellate. *Calyx* shorter than corolla tube, 5-lobed, divided nearly to base or forming a short tube; sepals broad, ovate, subequal, accrescent. *Corolla* longer than calyx; tube funnel-shaped or campanulate, limb plicate, 5-angled or shortly and broadly 5-lobed. *Stamens* 5, inserted on corolla tube, included; filaments linear; anthers roundish to oblong; pollen smooth. *Ovary* deeply 4-lobed, with single ovule in each lobe, hairy; styles 2, gynobasic, almost equalling corolla tube, linear or filiform; stigmas subglobose or capitate. *Capsule* 4-lobed; lobes subglobose, single-seeded. *Seeds* obovoid to subglobose; testa crustaceous; embryo curved; cotyledons flat, plicate; endosperm scanty.

An African genus of two or three species; two species in southern Africa. Wijnands & Meeuse (1990) proposed that *Falkia* is the correct name for this genus, but Verdcourt's (1996) proposal to conserve both the name and spelling of *Falkia* was recommended (see Brummitt 1999).

Leaves oblong to lanceolate-oblong or lanceolate, usually \pm twice as long as broad, but varying from less than twice as long to several times longer than broad, never distinctly cordate at base 1. *F. oblonga*
 Leaves broadly ovate to reniform, \pm as long as broad or slightly longer than broad, distinctly cordate at base 2. *F. repens*

1. ***Falkia oblonga* Bernh. ex Krauss** in Flora, oder allgemeine botanische Zeitung, Jena, Regensburg 27: 830 (1844); Hallier f.: 84 (1893a); Hallier f.: 41 (1899a); Baker & C.H.Wright: 82 (1904); A.Meeuse: 660 (1957a); Verdc.: 14 (1963a); Roessler: 6 (1967a); Gonç.: 12, t. 2 (1987); A.E.van Wyk & S.Malan: 52 (1988); Gonç.: 8, t. 2 (1992); Lejoly & Lisowski: 355 (1993b); Retief & P.P.J.Herman: 382 (1997). Type: KwaZulu-Natal, near Umlaas River, Krauss 359 (G, holo.; K).

F. oblonga Bernh. ex Krauss var. *minor* C.H.Wright: 82 (1904); Baker & Rendle: 65 (1905–06). Type: Cape, Fort Beaufort Div., Cooper 323 (K, PRE!, syn.); Queenstown Div., Qamata, Baur 536 (NU, PRE!, syn.); Griqualand West, by the Vaal River near Pniel, Roe in Herb. Bolus 2072 (BOL, K, PRE!, syn.). Mpumalanga, near Lydenburg, Wilms 1077 (B†, PRE!, syn.).

Hairy to glabrous perennial herb. *Stems* creeping underground, rooting at nodes, up to 0.5 m or longer. *Leaves* lanceolate to oblong-ovate,

base 5-nerved, truncate to almost cuneate, apex rounded to emarginate, 10–70 \times 3–14 mm, silvery silky, glabrescent above, adpressed pilose beneath; petiole up to 80 mm long. *Pedicel* 3–60 mm long, recurved in fruit. *Calyx* 4–7 mm long; tube 1–3 mm long; lobes oblong, acute, adpressed-pilose outside, enlarged in fruit to ovate and deltoid to subcordate, crisped along edges. *Corolla* 5–15 mm long, shallowly to deeply lobed; lobes emarginate, white to pale pink, drying yellow. *Stamens* inserted low down in corolla tube; anthers roundish. *Ovary* densely pilose; styles subulate, 8 mm long; stigmas capitate. *Capsule* \pm 2 mm long, membranous, pilose, enclosed by accrescent, marcescent calyx. *Flowering time* August to January. Figure 3.

Widespread in the summer-rainfall areas of southern Africa and also northwards and eastwards in tropical Africa as far as Ethiopia and Eritrea. It is found scattered in moist grassland

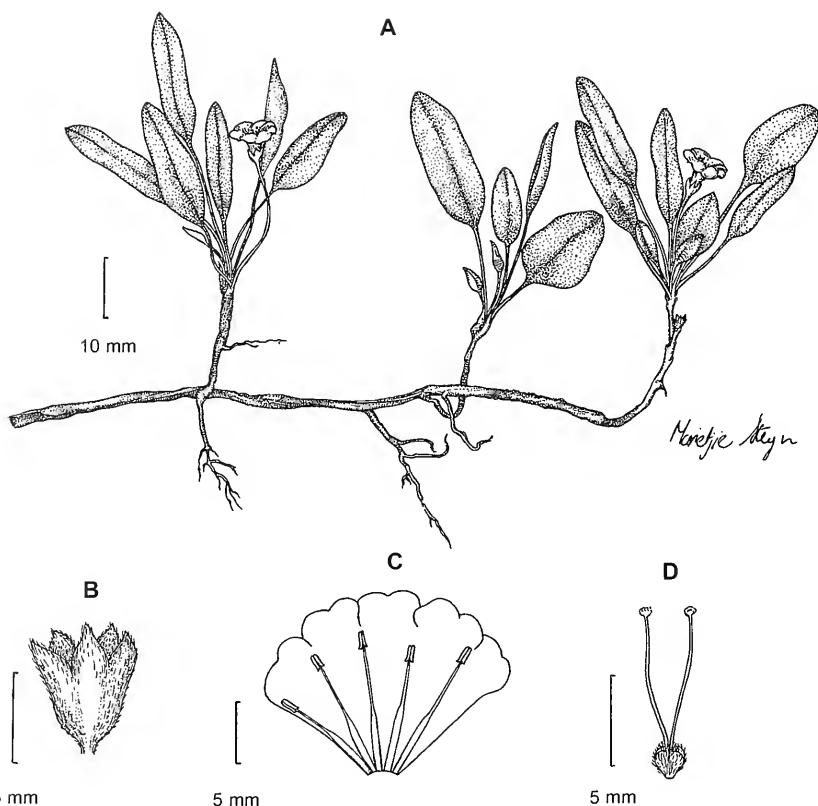


FIGURE 3.—*Falkia oblonga*: A, flowering stem; B, calyx; C, inside of corolla tube with stamens; D, ovary, styles and stigmas (Turner II25, PRE). Artist: Marietjie Steyn.

and other damp places and also on drier soils. Map 13.

Vouchers: Brueckner 967 (PRE); Louw 1031 (PRE); Schoenfelder S193 (PRE); Smith 305 (K, PRE, SRGH); Theron 1523 (PRE); Ward 796 (PRE).

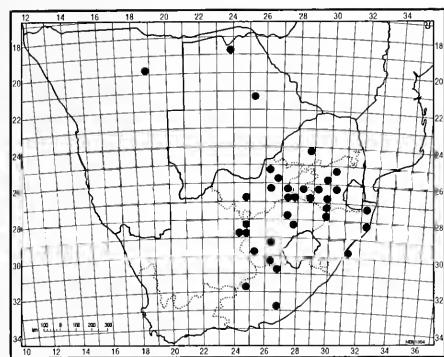
2. *Falkia repens* Thunb., Nova genera plantarum: 17 (1781); L.f.: 211 (1782); Choisy: 451 (1845); Hallier f.: 84 (1893a); Baker & C.H.Wright: 81 (1904); T.M.Salter: 686 (1950); A.Meeuse: 659 (1957a); A.Batten & G.W.Bo-

kelmann: 123, t. 98 (1966); Wijnands & A.Meeuse: 208 (1990). Type: Cape, *Thunberg* UPS-THUNB. 4455 (UPS, lecto.!).

F. repens Thunb. var. *diffusa* Choisy: 451 (1845); Baker & C.H.Wright: 82 (1904). *F. diffusa* (Choisy) Hallier f.: 85 (1893a). Type: Cape, Zuurberg, Enon, *Drège* s.n. (G, holo.).

F. repens Thunb. var. *sericea* Hallier f.: 84 (1893a). Type: Cape, Roodebloem, *Bergius* s.n. (B, holo.†); *H. Link* s.n. (B, holo.†).

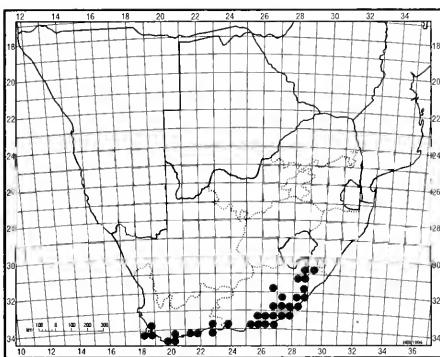
F. repens Thunb. var. *villosa* (Hallier f.) Baker: 81 (1904). *F. villosa* Hallier f.: 85 (1893a). Type: Western Cape, Constantia, *Bergius* s.n. (B, syn.†); Free State, Nieuwejaarspruit, Ecklon & Zeyher II4.10 (B†, PRE!, syn.).

MAP 13.—*Falkia oblonga*

F. dichondroides Baker: 82 (1904). Type: Eastern Cape, Uitenhage, Enon, *Drège s.n.* (K, PRE!, syn.).

Leaves broadly ovate to reniform, \pm as long as broad or slightly longer than broad, distinctly cordate at base. Description otherwise as for *F. oblonga*. Flowering time September to December.

Endemic to the winter-rainfall and all-year-rainfall areas of southern Africa and extending into the summer-rainfall areas of the Eastern Cape. Normally found on damp or temporarily inundated soil. *Falkia repens* buries its fruit actively into the soil by a downward bending of the peduncles after flowering, the persistent and indurate calyx enclosing the ripe fruit and acting as a protective structure. This incidence of geocarpy seems to be the only one in the genus. Map 14.

MAP 14.—*Falkia repens*

This taxon is very similar to the rather variable *F. oblonga* (no. 1), but differs consistently in leaf shape. Its distribution does not overlap that of *F. oblonga* or hardly so. Still, it may be only a geographical variant. The leaves of *F. repens* can sometimes resemble those of *Dichondra micrantha*, but flowering specimens can be distinguished easily.

Falkia repens has been recorded both as a weed and as a plant cultivated as a soil cover or soil binder (see Wells *et al.* 1986: 254). Used in the Eastern Cape as a remedy for bilharzia (*Dettman s.n.*, PRE) and as a cure for sores on the face (Van Eeden B342, PRE).

Vouchers: Acocks 9140 (PRE); Britten 804 (GRA, PRE); Marloth 1615 (PRE); Thode A687 (PRE).

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4. **EVOLVULUS**

***Evolvulus* L.**, Species plantarum, 2nd edn: 391 (1762); L.: 152 (1764); Baker & C.H.Wright: 79 (1904); Baker & Rendle: 66 (1905–06); Ooststr.: 19 (1934); E.Phillips: 621 (1951); A.Meeuse: 661 (1957a); Verdc.: 16 (1963a); Roessler: 5 (1967a); R.A.Dyer: 502 (1975); Gonç.: 12 (1987); Gonç.: 10 (1992); Lejoly & Lisowski: 357 (1993b); Gonç.: 6 (1996). Type species: *E. nummularius* (L.) L.

Volvulopsis Roberty: 28 (1952). Type species: *V. nummularius* (L.) Roberty.

Spreading annual or perennial herbs or subshrubs, not twining. *Leaves* usually small, simple, entire, often sessile. *Flowers* small, in small axillary 1–3-nate cymes or in terminal spike-like inflorescences; bracteoles small. *Sepals* 5, small, subequal, obtuse or acuminate, not accrescent. *Corolla* funnel-shaped or campanulate to subrotate or salver-shaped, entire, 5-angled or 5-lobed; limb pli-cate. *Stamens* 5, inserted above middle of corolla tube, rarely near base; filaments glabrous, linear; anthers linear or oblong; pollen smooth. *Ovary* ovoid or globose, 2-locular, or 1-locular by abor-tion. 2 ovules in each locule; styles 2, filiform, united at base or free, each divided above or almost to base; stigmas 4, linear-terete or subclavate. *Capsule* ovoid or globose, 2–4-valved, 1- or 2-locu-lar. *Seeds* 1–4, subglobose, glabrous.

A genus of about 100 species, all but two confined to tropical America; two species in southern Africa. *E. glomeratus* Nees & Mart. subsp. *grandiflorus* (Parodi) Ooststr., a low blue-flowered shrublet from tropical America, is sometimes cultivated.

Corolla shallowly lobed; capsule 2-locular; plant with erect to decumbent branches not root-ing at nodes; leaves elliptic to linear-oblong 1. *E. alsinoides*
Corolla deeply lobed; capsule 1-locular; plant prostrate, rooting at nodes; leaves almost orbicular 2. *E. nummularius*

1. *Evolvulus alsinoides* (L.) L., Species plantarum, 2nd edn: 392 (1762); Peter: 19 (1891); Hallier f.: 85 (1893a); Baker & C.H.Wright: 79 (1904); Baker & Rendle: 67 (1905–06); Ooststr.: 26 (1934); A.Meeuse: 661 (1957a); Letty: 272, t. 136 (1962); Heine: 339 (1963); Verdc.: 18 (1963a); Roessler: 6 (1967a); Compton: 474 (1976); Gonç.: 14, t. 3 (1987); A.E.van Wyk & S.Malan: 250 (1988); Gonç.: 11, t. 3 (1992); Lejoly & Lisowski: 358, fig. 3 (1993b); Gonç.: 7, t. 1 (1996); A.Fabian & Germish.: 334, t. 159k (1997); Retief & P.P.J.Herman: 382 (1997). Type: Sri Lanka, in Herb. Hermann 3: 55 (BM, lecto.).

Convolvulus alsinoides L.: 157 (1753).

C. linifolius L.: 306 (1759a). *E. linifolius* (L.) L.: 392 (1762). Type: Senegal, specimen 393.5 (LINN, lecto.).

Variable annual or perennial herb, thinly to rather densely covered with somewhat long patent silky hairs. *Stems* few to several, erect or

decumbent, slender, up to 600 mm long. *Leaves* subsessile, elliptic to linear-oblong, apex acute to obtuse, distinctly mucronate, 10–20(–30) mm long; petiole up to 3 mm long. *Inflorescence* axillary, 1–few-flowered; peduncle filiform, shorter to much longer than leaves; bracts lanceolate, up to 5 mm long; pedicels filiform, 2–10 mm long, spreading. *Calyx* densely silky or vil-lous; sepals ovate-lanceolate, acute, up to 5 mm long. *Corolla* rotate to broadly funnel-shaped, 6–8 mm long and wide, light blue, rarely white, folds paler beneath. *Ovary* 2-celled, glabrous; stigmas long, terete or subclavate. *Capsule* globose-depressed, 4-valved, glabrous, 3–4 mm long. *Seeds* 4, brown to black, smooth, ovoid, 1.7 mm long. *Flowering time* throughout the year, mostly October to May. Figure 4.

Widespread throughout the tropical and sub-tropical regions of both hemispheres. Common in the northern part of southern Africa where it is

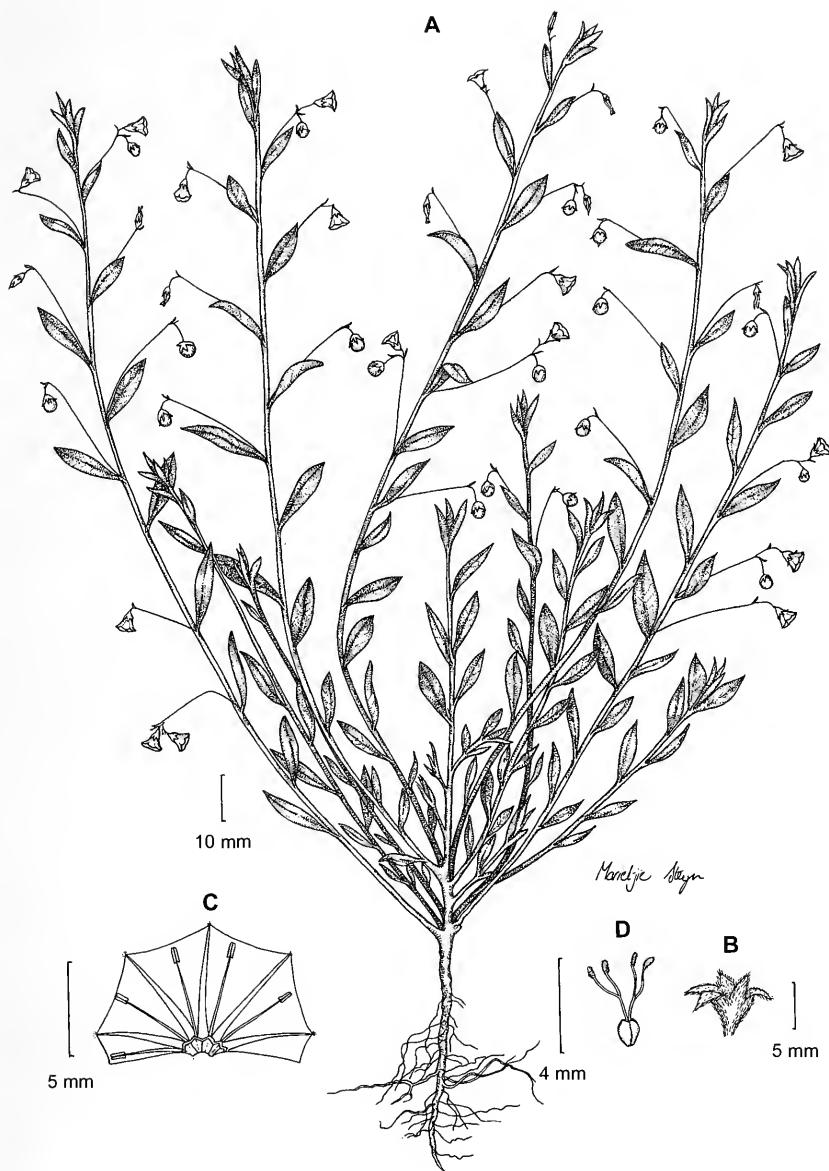
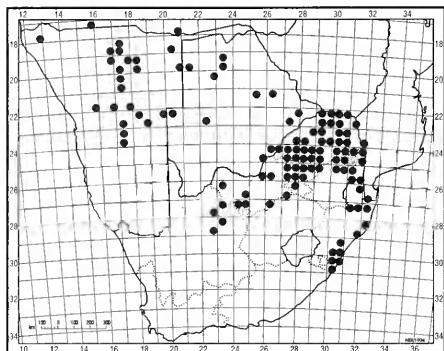


FIGURE 4.—*Evolvulus alsinoides*: A, plant; B, calyx; C, inside of corolla tube with stamens; D, ovary, styles and stigmas (Dyer & Verdoorn 4222, PRE). Artist: Marietjie Steyn.



MAP 15.—*Evolvulus alsinoides*

found mostly in more or less open savanna and thornveld. It can also occur as a weed in waste places and arable or pastoral land. Map 15.

This species is extremely variable and Van Ooststroom (1934), the monographer of the genus, recognised a large number of varieties, upheld by many other workers, but their delimitation is not always clear cut. The material from eastern and southern Africa almost always agrees with the var. *linifolius* (L.) Baker, but as Verdcourt (1963a) pointed out, this variety merges with other ones elsewhere. Distinguished by its small light blue pedunculate flowers.

Vouchers: Barnard 465 (PRE); Compton 24644 (PRE); Leistner 1673 (PRE); Merxmüller & Giess 30049 (M, PRE, WIND); Smith 380 (PRE, SRGH); Strey 11358 (NH, PRE).

2. ***Evolvulus nummularius* (L.) L.**, Species plantarum, 2nd edn: 391 (1762); Peter: 19 (1891); Hallier f.: 85 (1893a); Baker & Rendle: 68 (1905–06); Ooststr.: 114 (1934); Heine: 339 (1963); Verde.: 16, fig. 4 (1963a); Gonç.: 12 (1987); Gonç.: 10 (1992); Lejoly & Lisowski: 357 (1993b). Type: Jamaica, Sloane s.n. (BM–SL, lecto.).

Convolvulus nummularius L.: 157 (1753). *Volvulopsis nummularius* (L.) Roberty: 28 (1952).

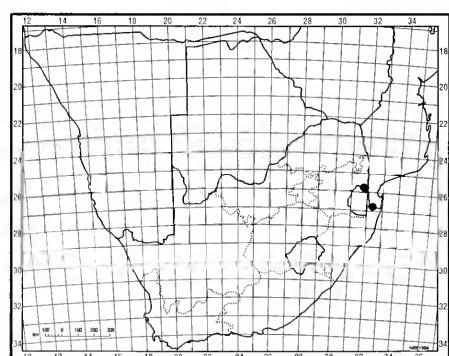
Perennial herb. Stems prostrate, pubescent, rooting at nodes. Leaves orbicular to orbicular-

ovate, 5–20 mm long and broad, apex obtuse or retuse, base truncate to subcordate, glabrous or sparsely pubescent beneath; petiole 1–8 mm long, pubescent, canaliculate above. Flowers solitary or rarely paired, axillary; peduncles up to 5 mm long, recurving. Sepals ovate to elliptic-ovate, 2.5–3.0 × 1.5 mm, subacute to acute, pubescent or glabrescent with ciliate margins. Corolla white, subrotate, 4.5 mm long, 6 mm wide, deeply lobed; lobes obovate, 1.5–2.5 mm long, 1.0–1.5 mm broad. Capsule globose, 3–4 mm in diameter, 1-locular, bivalved, (2–)4-seeded. Seeds subglobose, 1.5–2.0 mm long, brown to black, shiny. Flowering time November to April.

This species is indigenous to tropical America as well as tropical Africa and Madagascar and is introduced in India. It reaches its southernmost point of distribution in the most tropical part of the FSA area, namely northern KwaZulu-Natal. It seems to occur mostly in short grassland on sandy soils. Also found in dry forest and dense thicket or even on waste ground. Recorded as a weed in sisal plantations. Map 16.

Distinguished by its prostrate stems rooting at the nodes and its shortly petiolate, rounded leaves. Sterile specimens can be confused with *Dichondra micrantha* and *Falkia repens*, but the petioles in *E. nummularius* are never longer than 8 mm.

Voucher: Ward 3098 (PRE).



MAP 16.—*Evolvulus nummularius*

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5. SEDDERA

Seddera Hochst. & Steud. in Schimper, *Unio itiner.* no. 849 (1837), see Sebsebe: 398 (1998); Hochst.: 7, t. 5 (1844); Choisy: 440 (1845); Hallier f.: 572 (1893b); Hallier f.: 88 (1893a); Baker & Rendle: 73 (1905–06); E.Phillips: 622 (1951) p.p.; A.Meeuse: 662 (1957a); Verdc.: 24 (1963a); Roessler: 21 (1967a); R.A.Dyer: 502 (1975); Gonç.: 16 (1987); Gonç.: 13 (1992); Gonç.: 9 (1996). Type species: *S. virgata* Hochst. & Steud.

Breweria R.Br.: 487 (1810) p.p.; Benth. & Hook.f.: 876 (1876); Peter: 16 (1891); Baker & C.H.Wright: 79 (1904); E.Phillips: 622 (1951) p.p.

Small prostrate to erect shrubs or suffrutescences, never climbing, intricately branched, ± pubescent; old branches sometimes becoming spinescent. Leaves variously shaped, entire, small, usually with medifixed hairs, sessile or subsessile. Flowers 5-merous, axillary, sessile or pedunculate, solitary or aggregated into few-flowered clusters or pedunculate dense few-flowered cymes which sometimes form leafy terminal spikes or panicles. Bracteoles usually small. Sepals 5, acute or obtuse, subequal or outer ones slightly larger. Corolla small, usually white, funnel-shaped; limb usually shallowly lobed; midpetaline areas hairy at least at tips. Stamens inserted low down in corolla tube; filaments filiform, dilated at base and often appendaged; anthers oblong; pollen smooth. Disc absent or small. Ovary 2-locular, 4-ovuled, hairy at apex; style bifid almost or quite to base; stigmas almost peltate and orbicular, sometimes bilobed. Capsule 4-valved. Seeds dark brown or black, glabrous.

A genus of some 20 species mainly restricted to Africa, but extending to Madagascar, Arabia and India; three species in southern Africa.

The genus is hardly separable from *Bonamia*, which is usually climbing. As Verdcourt has repeatedly pointed out, e.g. in *Kirkia* 1: 27–28 (1961a), the final generic classification of the Convolvulaceae can be accomplished only by worldwide surveys. For the time being, we prefer to maintain the *status quo* here.

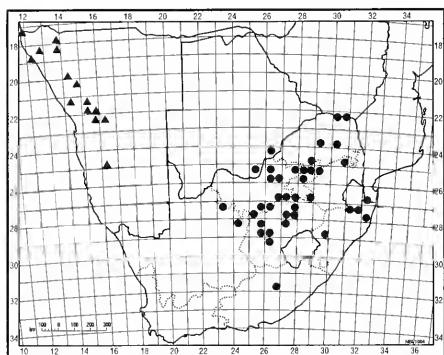
1a Sepals ± 2 mm long, obtusely rotundate 2. *S. schizantha*
 1b Sepals 4–9 mm long, acute:
 2a Flowers always solitary, sessile or very rarely pedicellate; calyx 7–10 mm long, sepals ciliate; corolla ± 10 mm long; pubescence usually distinctly brown or ferruginous with bulbous-based hairs 1. *S. capensis*
 2b Flowers usually in few-flowered axillary cymes, rarely all solitary, sessile or pedunculate; calyx usually only 4–7 mm long; corolla usually 6–7 mm long; pubescence almost invariably white or grey without bulbous-based hairs 3. *S. suffruticosa*

1. ***Seddera capensis* (E.Mey. ex Choisy)**
Hallier f. in *Bulletin de l'Herbier Boissier* 6: 529 (1898a); Baker & Rendle: 77 (1905–06); A.Meeuse: 663 (1957a); A.E.van Wyk & S.Malan: 52 (1988). Retief & P.P.J.Herman: 387 (1997). Type: Cape, Shiloh, *Drège s.n.* (G, holo.; L!).

Evolvulus capensis E.Mey. ex Drège: 46 (1843) nomen tantum, ex Choisy: 444 (1845); Hallier f.: 86 (1893a). *Breweria capensis* (E.Mey. ex Choisy) Baker: 80 (1904).

Bonamia capensis (E.Mey. ex Choisy) Burtt Davy & R.Pott-Leendertz: 121 (1912).

Suffruticose perennial. Stems several, tufted, prostrate to suberect from a firm woody taproot, up to 300 mm long, terete, covered with rusty brown appressed to patent stiff hairs as are petioles, leaves, pedicels, calyx and midpetaline areas of corolla. Leaves ovate, ovate-lanceolate or oblong, sessile or shortly petiolate, 5–25 ×



MAP 17.—● *Seddera capensis*
▲ *S. schizantha*

3–12 mm, apex obtuse or subacute, minutely mucronate, rounded to somewhat narrowed or truncate at base, strigose on both surfaces, more laxly so when older, ciliate with bulbous-based hairs along margin. *Flowers* axillary, solitary, usually sessile; pedicel rarely up to 10 mm long. *Bracteoles* 2, lanceolate, shorter than sepals. *Sepals* broadly lanceolate, acute, 4–9 mm long. *Corolla* broadly funnel-shaped, pinkish white, 6–12 mm long. *Style* branched nearly from base; stigmas subpeltate, bilobed. *Capsule* subglobose, usually crowned with a tuft of hairs, ± 5 mm in diameter. *Seeds* black, smooth. *Flowering time* September to May.

Common in the northern part of South Africa, uncommon in Botswana and the Eastern Cape, also in Zimbabwe. Occurs in grassland and thornveld and also in waste places. Map 17.

Distinguished by its solitary and usually sessile flowers with long calyx lobes.

Vouchers: *Acocks* 12500 (PRE); *Germishuizen* 3973 (PRE); *Moll* 4130 (PRE); *Repton* 3326 (PRE); *Rogers* 6850 (PRE).

2. *Seddera schizantha* Hallier f. in Bulletin de l'Herbier Boissier 6: 532 (1898a); Baker & Rendle: 78 (1905–06); Myint & D.B.Ward: 234 (1968); A.Meeuse & W.G.Wel-

man: 47 (1996). Type: Angola, Mossamedes, Newton 18 (Z, holo.).

Bonamia schizantha (Hallier f.) A.Meeuse: 665 (1957a); Roessler: 3 (1967a).

Metaporana angolensis N.E.Br.: 169 (1914). Type: Angola, Pearson 2391, 2873 (K, syn.).

Much-branched shrub up to at least 1 m high. *Branches* erect to climbing at tips, terete, adpressed-pubescent. *Leaves* ovate-elliptic to oblong, obtuse and mucronate at apex, rounded to subtruncate or subcordate at base, 10–40 × 4–15 mm, sparsely adpressed-hairy or glabrescent; petiole 1.5–3.0 mm long. *Peduncles* axillary, solitary or binate, slender, erect-patent, 3–18 mm long, bearing a dense dichasial inflorescence or a single unilateral cyme; inflorescences often collected in terminal panicles. *Bracts* and *bracteoles* lanceolate, 1.0–1.5 mm long, adpressed-puberulous. *Pedicels* filiform, 2–3 mm long. *Sepals* broadly ovate-spathulate to orbicular, obtusely rotundate, 2 × 1.5–2.0 mm, their margins membranaceous and partly ciliate. *Corolla* white with a 2 mm long cylindrical tube and a deeply 5-lobed limb; lobes 3.0 × 2.0–2.5 mm, elliptic, obtuse and patent, outside with brownish strigose hairs on mid-petaline zones. *Filaments* glabrous, dilated at base, 2–3 mm long; anthers nearly 1 mm long. *Ovary* ovoid, with a few hairs at apex; styles 2, free, equal, filiform, 4.0–4.5 mm long. *Capsule* subglobose with conical apex, 3.5–4.0 mm long and broad, exserted from calyx, glabrous. *Seeds* small, minutely punctate, brown or black. *Flowering time* December to March. Figure 5.

Occurs in the southern part of Angola and extends southwards to around Malta Höhe in Namibia. Map 17.

Known by its 2 mm long, obtusely rotundate calyx lobes.

Vouchers: *De Winter* & *Leistner* 5268 (PRE); *Müller* 1365 (PRE, WIND).

3. *Seddera suffruticosa* (Schinz) Hallier f. in Botanische Jahrbücher 18: 88 (1893a); Hallier f.: 531 (1898a); Baker & Rendle: 77

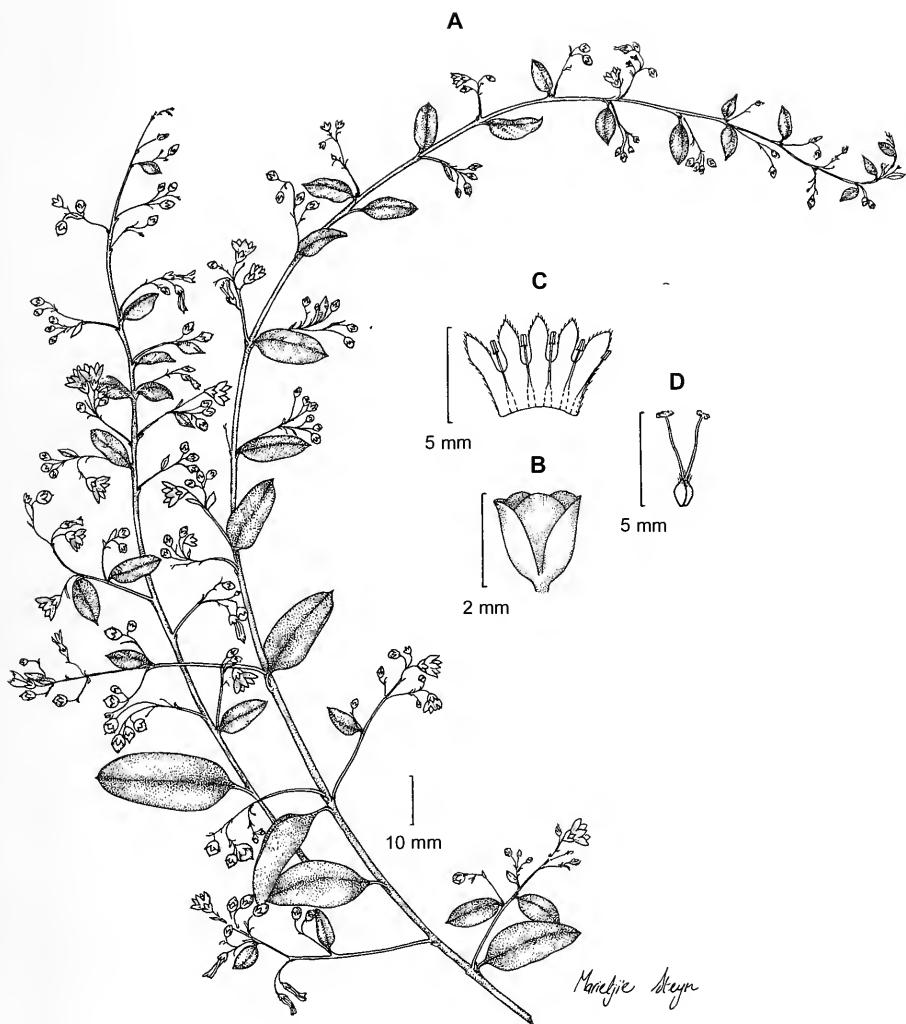


FIGURE 5.—*Seddera schizantha*: A, flowering stem; B, calyx; C, inside of corolla tube with stamens; D, ovary, styles and stigmas (Miller 1365, PRE). Artist: Marietjie Steyn.

(1905–06); A.Meeuse: 663 (1957a); Verde.: 27 (1963a); Roessler: 21 (1967a); Compton: 474 (1976); Gonç.: 17, t. 4 (1987); Gonç.: 15, t. 4 (1992); Gonç.: 9, t. 2 (1996); A.Fabian & Germish.: 336, t. 160f (1997); Retief & P.P.J.Herman: 387 (1997). Type: Namibia, Oshando, Upingtonia, Schinz 750 (Z, holo.; BOL!, GRA!, L!).

Breweria suffruticosa Schinz: 275 (1888); Baker & C.H.Wright: 80 (1904). *Bonamia suffruticosa* (Schinz) Burt Davy & R.Pott-Leendertz: 121 (1912).

Convolvulus mucronatus Engl.: 246 (1888). *S. mucronata* (Engl.) Hallier f.: 88 (1893a). Type: Northern Cape, Kuruman, Marlothi 1073 (B, holo.†; PRE!).

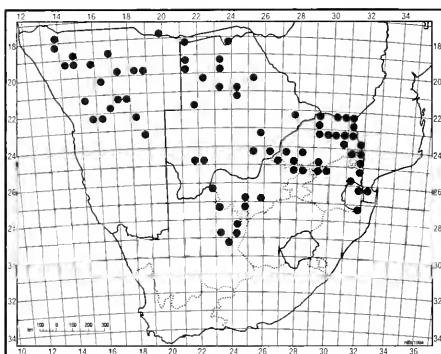
S. welwitschii Hallier f.: 88 (1893a); Hallier f.: 1009 (1897); Hiern: 724 (1898); Baker & Rendle: 77 (1905–06). Type: Angola, Welwitsch 6152, 6154 (B†, COI!, syn.).

Breweria conglomerata Baker: 68 (1894). *S. conglomerata* (Baker) Hallier f.: 1008 (1897). *S. suffruticosa* (Schinz) Hallier f. var. *hirsutissima* Hallier f.: 531 (1898a); Hiern: 725 (1898); Baker & Rendle: 77 (1905–06); Gonç.: 18 (1987). *Breweria suffruticosa* Schinz var. *hirsutissima* (Hallier f.) C.H.Wright: 81 (1904). Type: Angola, Welwitsch 6160 (B†, COI!, syn.).

S. wehwitschii Hallier f. var. *bakeri* Hiern: 725 (1898); Baker & Rendle: 78 (1905–06). Type: Angola, Luanda, Welwitsch 6157, 6158, 6159 (B†, COI!, syn.).

S. welwitschii Hallier f. subsp. *tenusepala* Verde.: 26, t. II (1961a). Type: Botswana, Sigara Pan, Drummond & Seagrief 5223 (K, holo.; LISC, SRGH).

Suffruticose or herbaceous perennial, extremely variable. *Stems* several to many from a woody rootstock, up to 600 mm long, erect or spreading, terete or subterete, at first \pm densely covered with stiff whitish hairs to villous, glabrescent; branchlets appressed pubescent or with dense patent hairs. *Leaves* subsessile, lanceolate to broadly elliptic-oblong, 5–40 \times 2–18 mm, acuminate, acute or rounded at apex and mucronulate, rounded at base, pilose to densely hirsute on both surfaces; petiole up to 4 mm long. *Flowers* in few-flowered, hairy, dense, sessile or pedunculate, axillary cymes, sometimes solitary; peduncles up to 30 mm long, bearing one to several flowers. *Bracteoles* shorter than calyx, lanceolate. *Calyx* 4–7 mm long, thinly strigose to densely villous; three



MAP 18.—*Seddera suffruticosa*

outer sepals lanceolate, acuminate, inner ones slightly shorter. *Corolla* almost campanulate, white or yellowish, \pm 6 mm long, limb spreading; midpetaline areas rather densely silvery strigose. *Ovary* hairy at apex. *Capsule* ovoid-subglobose, \pm 5 \times 6 mm, with some white hairs near apex. *Seeds* globose, black, 2 mm wide, smooth. *Flowering time* September to April.

Common in the northern part of southern Africa and also occurs in tropical Africa as far as Kenya. It grows mostly in semi-arid bushveld and open savanna on stony and sandy soils. Map 18.

Plants that are densely hairy, especially the inflorescences, with brownish hairs, somewhat more robust and with larger leaves are sometimes classified as var. *hirsutissima* Hallier f. and are reported to occur on Kalahari sand and serpentine soil (see Gonçalves 1987: 18). In our area this form is occasionally found in Botswana, northern Namibia and the Northern Province, together with the typical form. *Seddera suffruticosa* is recognised by its few-flowered axillary cymes and short calyx lobes.

Vouchers: Compton 29466 (PRE); Hutchinson 2478 (K, PRE); Lambrecht 171 (K, PRE, SRGH); Leistner 1317 (PRE); Merxmüller & Giess 30411 (M, PRE, WIND).

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6. BONAMIA

Bonamia Thouars, Histoire des végétaux recueillis sur les trois îles australes d'Afrique 1: 17, 32, t. 8 (1804); Thouars: 145 (1806) nom. conserv.; Peter: 17, 376 (1891); Hallier f.: 527, 573 (1893b); Hallier f.: 804, 996 (1897); Baker & Rendle: 78 (1905–06); Ooststr.: 75 (1938); Ooststr.: 398 (1953); A.Meeuse: 664 (1957a); Verdc.: 29 (1963a); Roessler: 3 (1967a); Myint & D.B.Ward: 123 (1968); R.A.Dyer: 503 (1975); Gonç.: 19 (1987); Gonç.: 16 (1992); Lejoly & Lisowski: 361 (1993b). Type species: *B. madagascariensis* Poir.

Breweria R.Br.: 487 (1810) p.p.

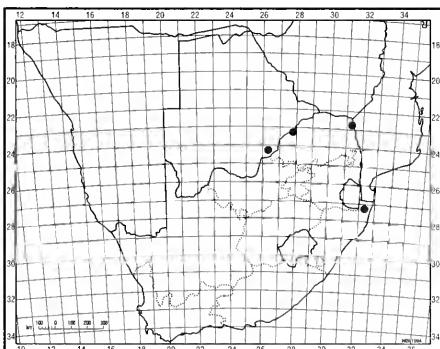
Herbaceous or woody climbers, rarely erect subshrubs. *Leaves* herbaceous or occasionally subcoriaceous, entire, lanceolate, ovate or elliptic. *Flowers* axillary, solitary or cymose; cymes sometimes forming terminal leafy panicles. *Bracteoles* usually small. *Sepals* 5, equal or subequal, rarely very unequal, circular to lanceolate, herbaceous or coriaceous, never membranous, not accrescent. *Corolla* funnel-shaped, medium-sized or small, blue or white, 5-lobed, sometimes deeply, with midpetaline bands hairy outside; lobes induplicate-valvate. *Stamens* 5, included or slightly exserted; filaments often dilated and hairy below, or glandular at base, or glabrous; anthers oblong, corollate or sagittate at base; pollen smooth. *Ovary* 2-locular, 4-ovuled, glabrous or hairy at apex; style bifid with two unequal branches or two often unequal styles nearly or quite free; stigmas 2, globose or peltate; disc rarely 2-partite, small or absent. *Capsule* subglobose, bilocular, 4-valved, 2-4-seeded. *Seeds* glabrous or pilose.

A genus of about 40 species widespread in the tropics of both hemispheres; one species in southern Africa (also see notes under *5. Seddera*).

Bonamia velutina Verdc. in Kirkia 1: 27, t. III (1961a); Gonç.: 21 (1987); Gonç.: 19 (1992); A.Meeuse & W.G.Welman: 46 (1996). Type: Zimbabwe, border opposite Chicuacuala, Wild 4688 (K, holo.; SRGH).

middle; stigmas large, lobulate-peltate. *Capsule* ellipsoid, subacute, appressed pilose at apex and base. *Seeds* 3–4 mm long, ellipsoid, brown-purple, glabrous, minutely punctate. *Flowering time* April to November. Figure 6.

Perennial herb or suffrutex, erect, up to 1 m high, tomentose. *Stems* woody, branched, velvety with appressed sericeous hairs. *Leaves* elliptic or elliptic-oblong, acute, 10–65 × 4–27 mm, mucronate at apex, rounded or subtruncate at base, greyish velvety pubescent above, densely coated with golden brown hairs beneath; petiole up to 7 mm long. *Flowers* in 1–3-flowered cymes; peduncles up to 5 mm long; pedicel up to 2 mm long; bracts leafy or minute. *Sepals* subequal, ovate-lanceolate, obovate or spatulate, subcoriaceous at base, densely golden velvety outside and middle inside, glabrous at base inside, pilose at apex. *Corolla* white, funnel-shaped, slightly 5-lobed, up to 15 mm long, silky pilose on midpetaline areas. *Ovary* ovoid, golden pilose; style bifid below



MAP 19.—*Bonamia velutina*.

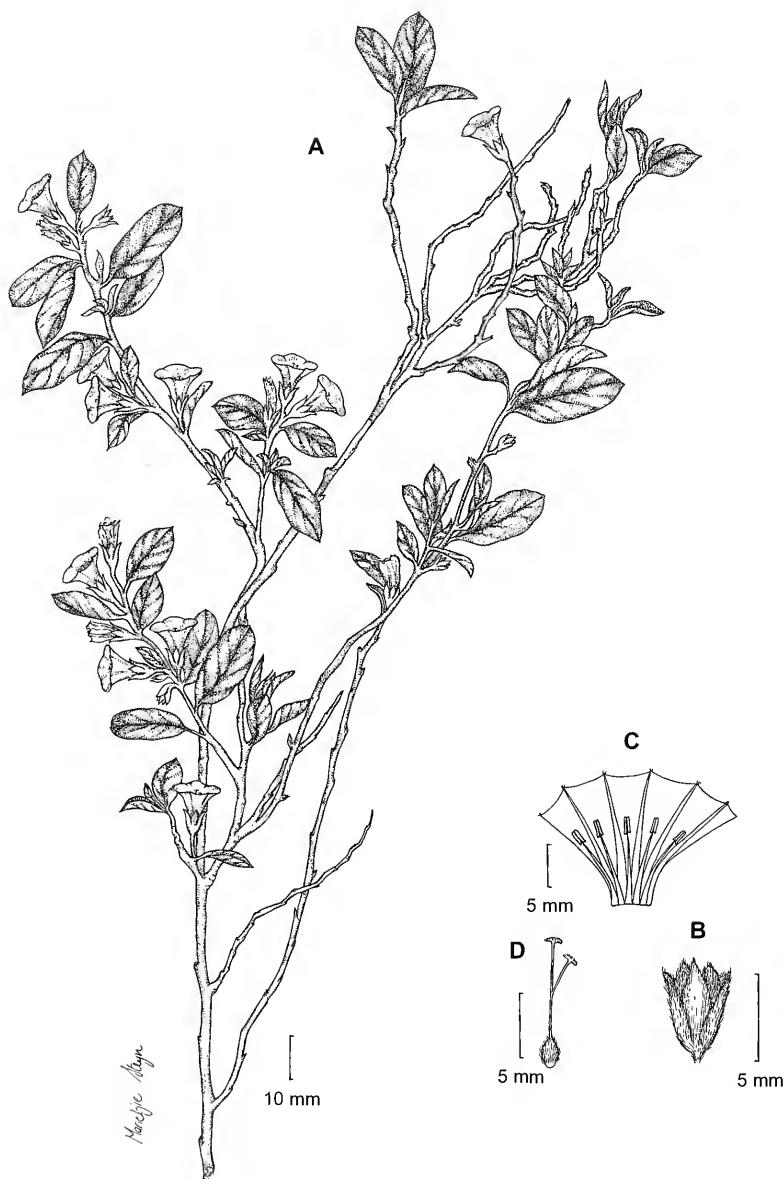


FIGURE 6.—*Bonamia velutina*: A, flowering stem; B, calyx; C, inside of corolla tube with stamens; D, ovary, styles and stigmas (Miller 473, PRE). Artist: Marietjie Steyn.

Grows in open and mixed woodland, sand forests and shrubby thickets on Kalahari sand, sandstone and grey soils. Very rare in the Northern Province and in the Ingwavuma area of KwaZulu-Natal. Also reported from southeastern Botswana, Zimbabwe and Mozambique. Map 19.

Bonamia velutina is sometimes confused with *Seddera capensis* and *S. suffruticosa*, but

can be recognised by the greyish velvety pubescence on the upper side of the leaves and the golden brown pubescence on the underside as well as on the calyx lobes.

Vouchers: *Froneman* 126 (Lowveld Botanical Garden Herbarium); *Miller* 473 (FHD, PRE); *Moll* 4352 (NH, PRE); *Van Rooyen* 617 (KNP).

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7. JACQUEMONTIA

Jacquemontia Choisy in Mémoires de la Société de Physique et d'Histoire Naturelle de Genève 6: 476 (1834); Choisy: 396 (1845); Peter: 33 (1891); Hallier f.: 578 (1893b); Baker & C.H.Wright: 69 (1904); Baker & Rendle: 85 (1905–06); E.Phillips: 622 (1951); Ooststr.: 431 (1953); A.Meeuse: 699 (1957a); Verdc.: 33 (1963a); Roessler: 18 (1967a); R.A.Dyer: 503 (1975); Gonç.: 22 (1987); Gonç.: 21 (1992); Lejoly & Lisowski: 368 (1993b). Type species: *J. azurea* (Desr.) Choisy.

Thyella Raf.: 84 (1838).

Herbaceous to woody, twining or prostrate, herbs or shrubs, rarely erect, usually hairy, with stellate or 2- or 3-armed hairs. *Leaves* variable, often cordate at base, entire, rarely lobed. *Inflorescence* usually bracteate. *Flowers* in axillary, usually pedunculate, umbellate or capitate cymes, with or without an involucle, or solitary. *Bracteoles* small, linear to lanceolate or outer ones larger, foliaceous. *Pedicels* very short or flowers sessile. *Sepals* 5, equal or unequal with 2 outer ones often large. *Corolla* small to medium-sized, funnel-shaped or campanulate, blue, mauve or pink, rarely white; limb 5-toothed or nearly entire, rarely lobed; midpetaline areas distinct. *Stamens* included; filaments linear, anthers oblong, pollen smooth. *Disc* small or none. *Ovary* 2-celled, 4-ovuled; style simple, filiform, included; stigmas 2, elliptic, ovate or oblong, ± flattened, rarely globose or filiform. *Capsule* globose, 2-celled, 4- or 8-valved, 4-seeded or less by abortion. *Seeds* usually glabrous.

Species about 120, mainly American, a few in tropical Africa, Asia and Australia; one species in southern Africa.

Jacquemontia tannifolia (L.) Griseb., Flora of the British West Indian Islands 5: 474 (1862); Peter: 33 (1891); E.A.Bruce: 63 (1940); A.Meeuse: 700 (1957a); Heine: 340 (1963); Verdc.: 35, fig. 10 (1963a); Roessler: 18 (1967a); Gonç.: 25 (1987); Gonç.: 24 (1992); Lejoly & Lisowski: 368 (1993b); Retief & P.P.J.Herman: 387 (1997). Iconotype: Dill., Hortus elthamensis t. 318, fig. 410 (1732).

Ipomoea tannifolia L.: 162 (1753). *Thyella tannifolia* (L.) Raf.: 84 (1838).

Convolvulus capitatus Desr.: 554 (1789). *J. capitata* (Desr.) G.Don: 283 (1837); Peter: 33 (1891); J.M.Wood & M.S.Evans: 13, t. 13 (1898); Baker & C.H.Wright: 69 (1904); Baker & Rendle: 85 (1905–06); Hutch. & Dalziel: 211 (1931). *I. capitata* (Desr.) Choisy: 365 (1845). Type: Senegal, *Geoffroy* s.n. (P-J, holo.).

Annual herb. *Stems* several from base, twining or trailing, occasionally suberect, up to ± 850 mm long, finely adpressed pilose with silky hairs, usually brownish, rarely whitish. *Leaves* ovate, oblong to broadly cordate, 40–90 × 20–80 mm, entire, acute to acuminate at apex, truncate to shallowly cordate at base, or even abruptly cuneate, glabrescent or ± pilose with

brownish or white hairs, ciliate; petiole slender, up to 45 mm long, usually much more densely pilose than blade or stem. *Flowers* in dense hairy capitate cymes 20–30 mm across, of a ferruginous colour when dry, supported by reduced bract-like leaves with narrowing base, ± 20 mm long, inner ones becoming smaller, lanceolate or linear, and more hairy, ultimately resembling sepals; peduncles up to 120 mm long, terete, silky pilose above. *Sepals* subequal, 5–7 mm long, lanceolate, acute, densely and softly hairy with ferruginous or rarely white hairs. *Corolla* blue, very rarely mauve to white, ± 10 mm long, funnel-shaped, 5-angled, obscurely 5-lobed, glabrous; midpetaline areas conspicuous, fugacious. *Capsule* globose, 4–5 mm wide, glabrous, straw-coloured. *Seeds* usually 4, brown, scabridulous, glabrous, 2.0–2.5 mm long. *Flowering time* December to May. Figure 7.

Occurs in the warmer parts of southern Africa, in tropical Africa south of the Sahara and also in Madagascar, the Mascarene Islands and tropical America. It usually grows at alti-

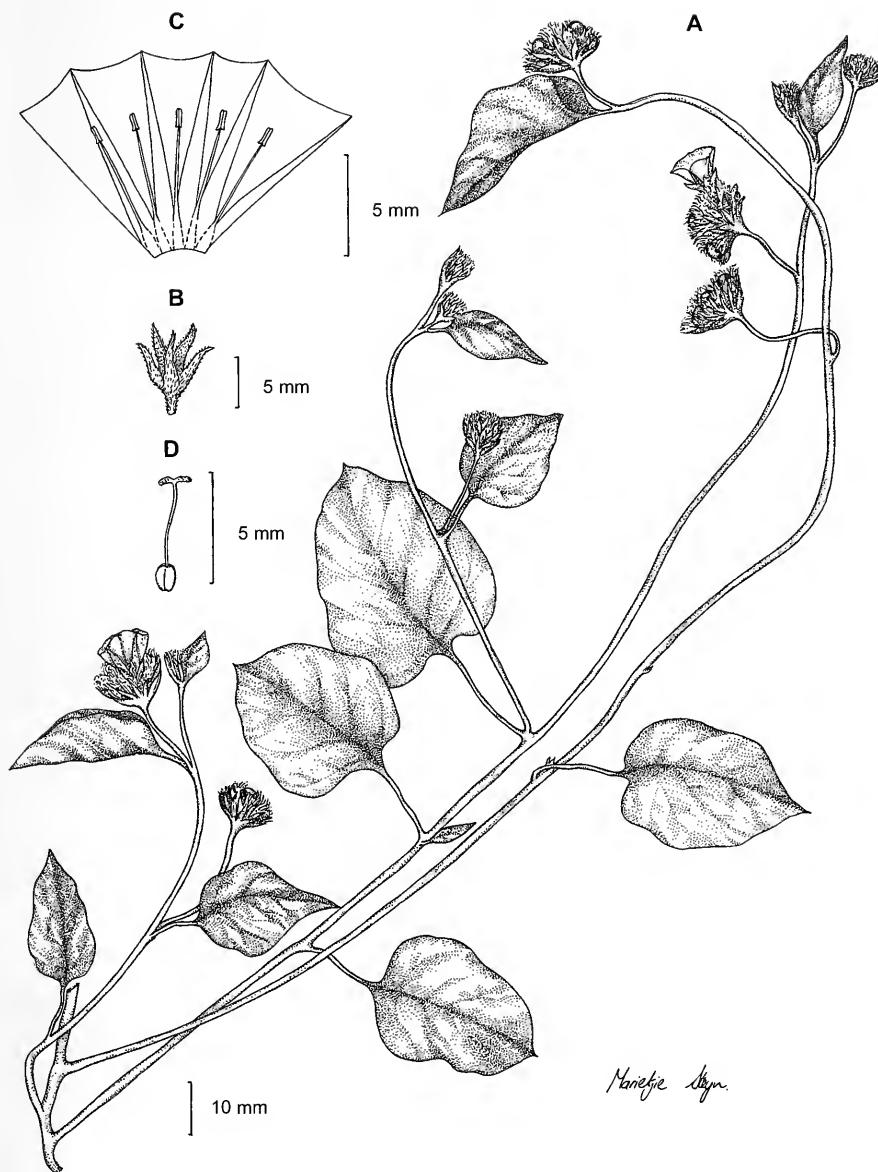
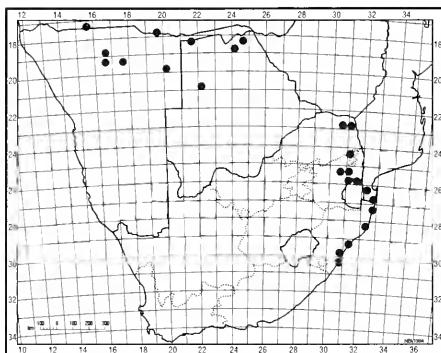


FIGURE 7.—*Jacquemontia tamnifolia*: A, flowering stem (Zambatis 1548, PRE); B, calyx; C, inside of corolla tube with stamens; D, ovary, style and stigmas (Barnard 301, PRE). Artist: Marietjie Steyn.



MAP 20.—*Jacquemontia tamnifolia*

tudes below about 1 000 m, mostly in subruder-
al habitats; also found in woodland, edges of
thickets, grassland, dry scrub, riverine forests,

on damp sandy ground, or even rocky soils and
cultivated land. Map 20.

Distinguished by its hairy capitate inflores-
cences and small blue flowers.

Vouchers: *Culverwell* 1326 (PRE); *Merxmüller* 1892 (M, PRE, WIND); *Smith* 3378 (PRE, SRGH); *Vahrmeijer* 586 (PRE); *Van der Schijff* 2425 (PRE).

Species excluded

Jacquemontia ovalifolia (Vahl) Hallier f. The
records of this species for Namibia [Baker &
Rendle: 87 (1905–06); Dinter: 427 (1922)—
Dinter 824 and *Höpfner* 21, Damaraland] are
based on erroneous identifications (Roessler
1967a: 18).

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8. CONVOLVULUS

Convolvulus L., Species plantarum, 1st edn: 153 (1753); L.: 76 (1754); Choisy: 399 (1845); Benth. & Hook.f.: 874 (1876); Peter: 33 (1891); Hallier f.: 579 (1893b); Baker & C.H.Wright: 70 (1904); Baker & Rendle: 88 (1905–06); E.Phillips: 622 (1951); A.Meeuse: 666 (1957a); Verdc.: 37 (1963a); Roessler: 3 (1967a); R.A.Dyer: 503 (1975); Gonç.: 26 (1987); Gonç.: 25 (1992); Lejoly & Lisowski: 370 (1993b); Gonç.: 13 (1996). Type species: *C. arvensis* L.

Annual or perennial herbs or subshrubs with erect, prostrate or twining stems. *Leaves* petiolate or nearly sessile, very variable, entire or lobed, often cordate, hastate or sagittate at base. *Flowers* axillary, solitary or in few-flowered, sometimes subumbellate cymes, small to medium-sized. *Sepals* 5, equal or subequal, persistent, obtuse to acute. *Corolla* funnel-shaped, white or pale mauve to pink; limb shallowly 5-lobed; midpetaline areas often hairy towards apices. *Stamens* 5, usually unequal, included; filaments filiform or somewhat linear, often dilated at base; pollen smooth, ellipsoid. *Disc* annular or cup-shaped. *Ovary* 2-locular, 4-ovuled; style simple, filiform, included; stigmas 2, usually linear or filiform. *Capsule* 2-locular, dehiscent, 4-valved. *Seeds* usually 4, black or brown, usually glabrous.

Species about 250, found mainly in the temperate and subtropical regions of both hemispheres, rare in the tropics. Fourteen species occur in southern Africa, nine of which are endemic and one which is introduced. The following exotic species of *Convolvulus* are cultivated: *C. cneorum* L. (subshrub with pink or white flowers, from southern Europe), *C. floridus* L.f. (large shrub with white flowers, from the Canary Islands), *C. mauritanicus* Boiss. (prostrate perennial herb with blue flowers, from North Africa).

- 1a Corolla 4–5 times as long as calyx, usually quite glabrous; sepals obtuse at apex; peduncles mostly longer than leaves and 1-flowered; leaves hastate-sagittate, entire (introduced weed) 2. *C. arvensis**
- 1b Corolla less than 4–5 times as long as calyx:
 - 2a Flowers almost sessile, in few-flowered clusters or occasionally solitary; calyx 8–13 mm long, accrescent, outer sepals ultimately subcordate, crisped along edges; corolla scarcely longer than calyx (Namibia) 1. *C. argillicola*
 - 2b Flowers distinctly pedunculate or at least pedicellate; corolla 1.5–3 times as long as calyx:
 - 3a Plants glabrous on all parts; peduncles 1-flowered; leaves varying in shape from linear, entire or with basal auricles to palmatisect, often on one specimen, but always small, up to 20 mm long, rarely attaining length of 40 mm 7. *C. dregeanus*
 - 3b Plants hairy on either stems, leaves or inflorescences, very rarely plants quite glabrous, but, if so, then leaves different in shape or well over 20 mm long and/or inflorescences 2–several-flowered:
 - 4a Leaves (at least upper ones) linear, hastate at base with patent, often deeply bifid basal lobes; sepals quite glabrous or rarely almost pubescent, coriaceous with membranous edges, broad, obtuse, sometimes mucronate 4. *C. bidentatus*
 - 4b Leaves various, but, if linear and hastate or auricled at base, then either whole plant densely tomentose or basal lobes entire to faintly bilobed or calyx distinctly hairy; sepals often acute or without membranous edges:
 - 5a Peduncles absent or rarely up to ± 2 mm long (bracteoles in leaf axils or nearly so); flowers solitary; corolla up to ± 14 mm long, its lobes usually distinctly acute:

6a Sepals densely tomentose, obtuse or subacute, often somewhat abruptly narrowed above the middle, 6–8 mm long; corolla 12–14 mm long; leaves often thick with revolute edges, densely tomentose, usually palmately 5-fid with linear lobes 12. *C. ocellatus*

6b Sepals \pm laxly covered with silky, shiny, golden-brown hairs, \pm ovate; corolla \pm 9 mm long; leaves flat and rather thin, pinnately lobed with central lobe the largest, usually thinly hairy (also depauperate specimens of *C. sagittatus*) 5. *C. boedeckerianus*

5b Peduncles usually distinct although occasionally very short (if so, flowers 14–16 mm long or longer and/or lobes of corolla rounded or obtuse):

7a Leaves up to \pm 25 mm long, with 5–9 narrow, linear or filiform, obtuse, palmately arranged lobes; plant usually finely, densely and very shortly white-tomentose or silvery tomentose, more rarely fawnish tomentose; peduncles always 1-flowered, up to 20 mm long 10. *C. multifidus*

7b Leaves different in shape or well over 25 mm long or plant not very shortly tomentose; peduncles often longer than 20 mm:

8a Peduncles usually 2–6-flowered, rarely 1-flowered:

9a Vegetative parts and peduncles densely and shortly, \pm adpressed-hairy to sericeo-tomentose, often canescent, sometimes fulvous 3. *C. aschersonii*

9b Vegetative parts not so densely hairy or plants farinose:

10a Corolla 8–14 mm long:

11a Corolla 8–10 mm long; sepals sometimes very unequal; leaves linear to oblong with usually obtuse apex 13. *C. sagittatus*

11b Corolla 12–14 mm long; leaves usually cordate-deltoid; basal lobes \pm bilobed but not dissected, apex of blade usually acute to acuminate 8. *C. farinosus*

10b Corolla 15–20 mm long or longer:

12a Leaves usually not dissected, often cordate or cordate-oblong, crenate, occasionally oblong to linear-sagittate; corolla white or cream-coloured to greenish white (not SW Cape) 11. *C. natalensis*

12b Leaves either dissected or, if entire, found in SW Cape; corolla often pale pink or rose-coloured (especially after drying):

13a Leaves pinnately nerved, linear to linear-oblong with hastate and toothed to dissected base; margin of central lobe often sinuous, or irregularly pinnatilobed to deeply pinnatisect (not SW Cape) 14. *C. thunbergii*

13b Leaves palmately nerved, palmatilobed or palmatifid, occasionally linear with palmately arranged smaller basal lobes or auricled, if entire, then \pm oblong-cordate, ovate-cordate to subreniform (SW Cape) 6. *C. capensis*

8b Peduncles usually 1(2)-flowered:

14a Corolla usually shorter than 15 mm, often smaller, rarely up to \pm 20 mm long, but if longer than 15 mm, then either leaves linear-sagittate or linear, or plants from Namibia:

15a Erect or prostrate, suffruticose, rarely climbing; whole plant densely tomentose or sericeous up to sepals; leaves often with crenate and/or reflexed margins; peduncles up to \pm 10 mm long, often shorter; pedicels up to \pm 15 mm long (much shorter if peduncles are rather long) 12. *C. ocellatus*

15b Prostrate to climbing, herbaceous, never so densely tomentose but usually thinly hairy; leaves not with reflexed margins; peduncles often longer than 10 mm; pedicels usually short, rarely up to 30 mm long 13. *C. sagittatus*

14b Corolla usually longer than 15 mm, often longer than 20 mm; leaves usually not linear, often somewhat cordate or dissected (not Namibia):

16a Whole plant usually densely hairy to tomentose or shortly villous; leaves ovate-cordate-deltoid or oblong-cordate to deltoid, entire or finely crenate; calyx villous; sepals sharply and abruptly acuminate-apiculate, \pm 20 mm long (only E Cape) 9. *C. galpinii*

16b Plant either not densely villous-hairy, or, if so, then sepals usually not abruptly acuminate-apiculate and/or leaves different in shape:

17a Leaves usually not dissected, often cordate or cordate-oblong, crenate, occasionally oblong to linear-sagittate; corolla white or cream-coloured to greenish white (not SW Cape) 11. *C. natalensis*

17b Leaves either dissected or, if entire, then found in SW Cape; corolla often pale pink or rose-coloured, especially after drying:

18a Leaves pinnately nerved, linear to linear-oblong with hastate and toothed to dissected basal lobes, margin of central lobe often sinuous, or leaves irregularly pinnatifolied to pinnatisect (not SW Cape) 14. *C. thunbergii*

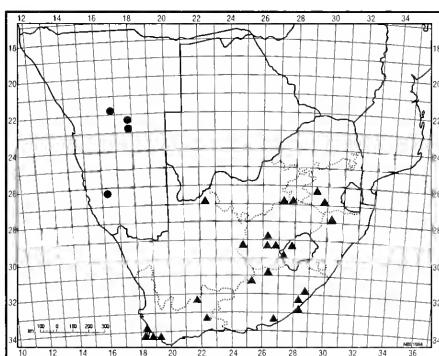
18b Leaves palmately nerved, palmatifolied or palmatifid, occasionally linear with or without palmately arranged small basal lobes, or auricled, if entire, then oblong-cordate, ovate-cordate to subreniform 6. *C. capensis*

1. *Convolvulus argillicola* Pilg. in Botanische Jahrbücher 48: 348 (1912); Dinter: 240 (1919); A. Meeuse: 670 (1957a); Roessler: 4 (1967a). Type: Namibia, Auas Mts, Dinter 1892 (B, syn.†; SAM, isosyn.!). Namibia, Quartel nr Rehoboth, Dinter 2153 (B, syn.†; SAM, isosyn.!).

Stems several from perennial taproot, suffructicose at base, prostrate, like young parts, leaves, petioles and calyx densely covered with stiff rust-brown or whitish hairs, ultimately glabrescent, rather firm and stout, terete and longitudinally striate, up to 700 mm long. Leaves ovate or oblong in outline, obtuse or acute, 20–50 \times 10–30 mm, usually with minute apical mucro, truncate to broadly and shallowly cordate at base with blade almost cuneately decurrent on petiole, irregularly crenate or pinnatifolied to pinnatisect; lobes usually obtuse, often again crenate to somewhat lobed; petiole slender, 5–30 mm long. Flowers solitary or few together in leaf axils, nearly sessile; bracts subulate or lanceolate-subulate, 7–10 mm long, hairy. Sepals unequal, outer ones herbaceous, long-acuminate from an ovate base, 12–13 mm long, acute, hirsute, two inner ones shorter and narrower, indurate, caudate-acuminate, \pm 10 mm long,

glabrous except for hirsute tips. Corolla white, almost as long as calyx, widely funnel-shaped to rotate, with a few stiff hairs towards tips of lobes on midpetaline areas. Ovary glabrous. Capsule subglobose, \pm 9 mm wide. Seeds glabrous, verruculose or rugose, black, 5–6 mm long. Flowering time throughout the year.

Endemic to Namibia where it grows on river banks and grassy plains with scattered short bushes, in red sand or calcareous soil. Map 21.



MAP 21.—● *Convolvulus argillicola*
▲ *C. arvensis*

Distinguishing characters: almost sessile flowers having outer sepals with crisped edges and a short corolla.

Vouchers: *Codd 5811* (PRE); *Merxmüller 836* (M, PRE, WIND); *Merxmüller 1032* (M, PRE, WIND).

2. ****Convolvulus arvensis* L.**, Species plantarum, 1st edn: 153 (1753); Choisy: 406 (1845); Peter: 35 (1891); Hallier f.: 108 (1893a); Baker & C.H.Wright: 75 (1904); Baker & Rendle: 97 (1905–06); E.Phillips: 44 (1938); A.Meeuse: 695 (1957a); Verde.: 41 (1963a); M.D.Hend. & J.G.Anderson: 242 (1966); Gonç.: 30 (1987); Gonç.: 29 (1992); Retief & P.P.J.Herman: 380 (1997). Type: Sweden, specimen 218.1 (LINN, lecto.).

Perennial herb forming several to many annual stems from a long taproot. *Stems* prostrate or twining, 0.75–1.75 m long, angular, sparsely pubescent to glabrous. *Leaves* often secund, entire, ovate-oblong, oblong or lanceolate with hastate or sagittate base, apex usually obtuse and mucronate, 20–50 mm long, glabrous or thinly hairy; petiole shorter than blade. *Flowers* axillary, solitary or sometimes in 2- or 3-more-flowered cymes; peduncles angular, shorter or longer than leaves; bracteoles linear, \pm 3 mm long; pedicel always much longer than calyx. *Sepals* slightly unequal, 3.5–5.0 mm long; outer ones a little shorter, elliptic-oblong, obtuse, often shortly ciliate, glabrous or hairy; inner ones broader, to almost orbicular, obtuse to slightly retuse, mucronulate, usually glabrous. *Corolla* white or pink, white ones sometimes with pink or red midpetaline areas, broadly funnel-shaped, glabrous, except at very tips of midpetaline areas, 15–25 mm long and 20–30 mm wide, limb shallowly lobed. *Stamens* slightly unequal; filaments with broadened base which is papillose at the margins. *Ovary* glabrous. *Capsule* ovoid-globose, glabrous, 5–8 mm long. *Seeds* 4, dark brown or black, glabrous, minutely verrucose-rugose, 3–4 mm long. *Flowering time* October to March.

Originally a native of Europe and parts of Asia, but now a common weed on cultivated

soils in temperate and subtropical areas throughout the world, rarely in the tropics. Found throughout South Africa except the Northern Province, and also in Lesotho. Map 21.

Distinguishing characters: entire, hastate-sagittate leaves and a 15–25 mm long corolla.

It frequently occurs in grain lands where it is especially obnoxious because it mats the culms together and induces layering, thus hampering harvesting. Even small parts of its taproot that survive can make eradication difficult. *Convolvulus arvensis* has poisonous properties and is used medicinally in various countries (Watt & Breyer-Brandwijk 1962: 306).

Vouchers: *Breyer TRV16975* (PRE); *Gemmell BLFU6475* (BLFU, PRE); *Schmitz 6585* (PRE, ROML); *Troughton 385* (GRA, PRE); *Turner 1159* (PRE).

3. ***Convolvulus aschersonii* Engl.**, Über die Hochgebirgsflora des tropischen Afrika: 349 (1892); A.Meeuse: 677 (1957a); Heine: 340 (1963); A.Meeuse & W.G.Welman: 47 (1996). Type: Ethiopia, Messhall, *Schimper* 660 (B, holotype).

C. sagittatus Thunb. var. *aschersonii* (Engl.) Verde.: 345 (1957a); Verde.: 43 (1963a); Gonç.: 28 (1987); A.E.van Wyk & S.Malan: 52 (1988). Type as above.

Perennial forming annual prostrate or sometimes twining stems from a woody taproot. *Stems* terete, herbaceous but firm, densely covered (as are all vegetative parts and outer sepals) with a fulvous or silvery white pubescence, up to \pm 2 m long. *Leaves* variable in shape, often on the same plant, but generally oblong to lanceolate-oblong, varying to linear-hastate or ovate, usually hastate at base with basal auricles lobed or dissected and central lobe irregularly crenate-repand-pinnatilobed, not infrequently with 2 small oblong lateral lobes at base and leaf subpalmately 5–7-lobed, sometimes pinnatisect, 30–60 mm \times 5–35 mm; pubescence usually strigose on upper surface, less adpressed on lower one; apex usually obtuse to rounded, emarginate and minutely reflexed-mucronate,

rarely acute; main nerves and midrib impressed above, prominent below; petiole usually rather stout, terete, 5–20 mm long. *Peduncles* usually longer than petioles, slender, terete, subumbellately to cymosely 1–6-flowered; bracteoles linear or oblanceolate, 3–4 mm long; pedicels short. *Sepals* unequal; outer ones herbaceous, oblong, elliptic or ovate-oblong, hairy and ciliate, obtuse or acute, sometimes crisped along margins, 6–7 mm long; inner ones almost glabrous except at tips, membranous to thinly coriaceous, marcescent, shorter (innermost \pm 4 mm long), much broader, much imbricate. *Corolla* funnel-shaped, white or very pale mauve-pink, sometimes with mauvish markings in throat, 7–10 mm long and wide; midpetaline areas pale greenish outside, silky towards apex. *Stamens* with a few short, rounded papillae near base. *Capsule* globose, apiculate, glabrous, 6–7 mm wide. *Seeds* dark brown, finely verrucose-rugose, 3–4 mm long. *Flowering time* November to April.

Widely distributed from Eritrea and Ethiopia southwards and westwards to Angola, Botswana (Gonçalves 1987: 28) and the northern part of South Africa in the Northern Province, North-West and Gauteng. Occurs in bushveld, savanna and grassland, on dry and sandy soils; also along roadsides and on cultivated ground. Map 22.

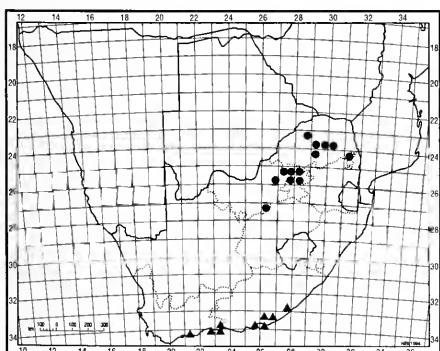
Distinguishing characters: densely hairy vegetative parts and markedly toothed or dissected leaves.

Vouchers: *Hutchinson* 2895 (BOL, GRA, K, PRE); *Meeuse* 9151 (PRE); *Skarpe* S-201 (K, SRGH); *Van Wyk* 2110 (PRE).

4. *Convolvulus bidentatus* Bernh. ex Krauss in Flora, oder allgemeine botanische Zeitung, Jena, Regensburg 27: 829 (1844); Hallier f.: 105 (1893a) in syn.; A. Meeuse: 685 (1957a). Type: Western Cape, George, Krauss s.n. (B, holo.†); Cape, Thunberg (UPPS, neo.; PRE, photo.!).

C. hastatus Thunb.: 35 (1794); Thunb.: 17 (1818); Choisy: 407 (1845) ex parte; Hallier f.: 105 (1893a); Baker & C.H. Wright: 72 (1904) excl. var. *natalensis* Baker, non *C. hastatus* Forssk. (1775), nec Desr. (1789). Type: Cape, Thunberg (UPPS, holo.).

Perennial with a thick taproot. *Stems* several, slender, prostrate or climbing, up to \pm 3 m long, usually somewhat 4-angled, glabrous or sometimes pubescent. *Leaves* narrowly hastate to linear with hastate base, glabrous or pubescent, up to 45–70 mm long and middle lobe 1–8 mm wide; basal lobes up to 25 mm long, usually deeply bifid; apex usually obtuse, mucronate; margin entire; lowermost leaves, if present, sometimes broader, oblong or sagittate-oblong or occasionally palmately 5–7-lobed with middle lobe the longest, up to 15 mm wide. *Peduncles* mostly 2-flowered, rarely 1-flowered or cymosely 3–5-flowered, 30–140 mm long, rarely shorter, pubescent or glabrous; bracts lanceolate, 3–5 mm long; pedicels short, pubescent, usually somewhat 4-angled and subclavate, 5–15 mm long. *Calyx* 6–8 mm long, glabrous or very rarely obscurely pubescent; sepals broadly ovate or obovate, rather chartaceous with membranous edges, much imbricate, obtuse to rounded, apex often almost mucronate. *Corolla* 15–22 mm long, white or pale pink; midpetaline areas slightly hairy outside near apex. *Capsule* globose, glabrous, \pm 6 mm wide, almost completely enclosed in calyx. *Seeds* black, minutely rugose and subpuberulous with tufts of very minute brown hairs. *Flowering time* October to March.



MAP 22.—● *Convolvulus aschersonii*
▲ *C. bidentatus*

Endemic to the Western and Eastern Cape, occurring in the coastal area from about Bredasdorp to East London, mostly in fynbos on sandy soils. Map 22.

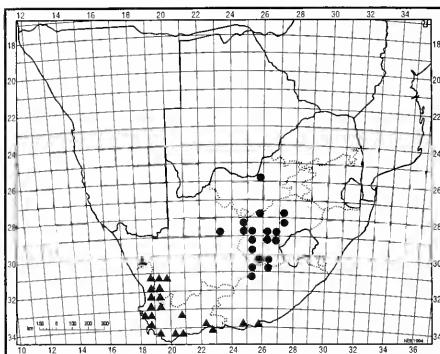
Distinguishing characters: linear leaves with bifid basal lobes and sepals with membranous edges.

Said to be used medicinally (Watt & Breyer-Brandwijk 1962: 306), but the records seem doubtful.

Vouchers: *Marais* 155 (PRE); *White* 92 (GRA, PRE).

5. ***Convolvulus boedeckerianus* Peter** in Die natürlichen Pflanzenfamilien 4,3a: 36 (1891), nomen subnudum, *ex Hallier* f.: 102 (1893a); *Baker* & C.H.Wright: 76 (1904); A.Meeuse: 674 (1957a); *Retief* & P.P.J.Herman: 380 (1997). Type: Free State, *Boedecker* s.n. (GOETT, lecto.).

Perennial, forming several woody stems from crown of a long woody taproot; vegetative parts and calyx covered with adpressed, usually golden-brown or fulvous, more rarely silvery white, hairs. Stems slender, prostrate or occasionally twining at the ends, rarely suberect, terete, sometimes nearly glabrous, up to \pm 600 mm long. Leaves usually pinnately to sub-palmately 5-lobed, lower ones often ovate or oblong, coarsely dentate to pinnatilobed, gradually changing upwards into divided, more typical leaves, 10–60 mm long; middle lobe of blade usually distinctly the largest, often irregularly toothed or pinnatilobed to pinnatisect, rarely quite entire; basal lobes (auricles) usually bifid; lateral lobes usually linear, entire or slightly toothed, sometimes pinnatilobed; pubescence usually rather sparse to glabrescent; petiole 1–8 mm long. Flowers solitary; peduncles usually wanting, if present, then very short; bracteoles subulate, minute; pedicel 2–10 mm long, somewhat elongating and glabrescent in fruit. Calyx 4–6 mm long, tomentose to laxly hairy; sepals subequal, ovate, acute, 2–3 mm wide. Corolla white, pale pink or pale pinkish



Map 22.—● *Convolvulus boedeckerianus*
▲ *C. capensis*

mauve, 7–10 mm long, limb 9–12 mm wide, 5-angled with acute triangular lobes; midpetaline areas silky pubescent outside. Capsule glabrous, globose or ovoid-globose, apiculate, straw-coloured, 5–7 mm wide. Seeds dark brown, when ripe distinctly verrucose-rugose or almost muriculate, \pm 4 mm long. Flowering time October to May.

Endemic to the central parts of South Africa in North-West, the Free State and the Northern and Eastern Cape, in grassland and False Upper Karoo vegetation on stony and sandy soils. Map 23.

Distinguishing characters: solitary flowers with obsolete peduncles and hairy calyx.

Vouchers: *Brueckner* 600 (PRE); *Louw* 1976 (PRE); *Smith* 3926 (PRE).

6. ***Convolvulus capensis* Burm.f.**, Prodromus florae capensis: 5 (1768); Choisy: 410 (1845); Hallier f.: 105 (1893a); *Baker* & C.H.Wright: 78 (1904) excl. var. β and var. γ ; A.Meeuse: 692 (1957a); A.Meeuse & W.G.Welman: 47 (1996). Type: Cape, in Herb. Burman without collector or locality (G-Del., holo., PRE, photo!).

C. plicatus Desr.: 558 (1789); Choisy: 410 (1845); Hallier f.: 106 (1893a). *C. capensis* Burm.f. var. *plicatus* (Desr.) Baker: 78 (1904) as to new combination only, excl. descr.,

synonyms and specimens cited; A.Meeuse: 693 (1957a). Type: Cape, *Sonnerat s.n.* in Herb. Lamarck (P, holo., PRE, photo.).

C. alceifolius Lam.: 461 (1791); Choisy: 410 (1845); Hallier f.: 105 (1893a). Type: Cape, in Herb. Lamarck without collector or locality (P, holo., PRE, photo.).

C. filiformis Thunb.: 16 (1818); Thunb.: 168 (1824); Baker & C.H.Wright: 71 (1904), non Desr. (1789). Type: Cape, *Thunberg s.n.* in Herb. Thunberg (U, holo., PRE, photo.).

C. inconspicuus Hallier f.: 106 (1893a); Baker & C.H.Wright: 71 (1904). Type: Northern Cape, Namaqualand. Leliefontein, *Drège s.n.* (L, iso.).

Merremia bowieana Rendle: 63 (1901); *Ipomoea bowieana* (Rendle) Baker: 55 (1904). *C. capensis* Burm.f. var. *bowieana* (Rendle) A.Meeuse: 693 (1957a). Type: Western Cape, Swellendam and George, *Bowie s.n.* (BM, holo., PRE, photo.).

Perennial. Stems climbing or sometimes prostrate, herbaceous, occasionally suffruticose, ascending, slender, terete, up to at least 1.5 m long, usually clothed (like leaves, petiole and calyx) with brown pubescence, glabrescent, more rarely glabrous or nearly so (if so, leaves and petioles also less hairy). Leaves often variable in shape on a single specimen; lower leaves narrowly reniform to cordate-oblong or almost hastate-oblong, rounded to subacute or emarginate at the apex, up to 35 mm long, with subentire to repand, crenate or dentate margin; petiole 5 mm long; upper leaves pinnately incised or palmately 5-fid, uppermost usually consisting of 5 linear lobes of which the central one is the longest; lobes usually variously lobed or incised, linear lobes of uppermost leaves less so to entire, length of blade 10–70 mm, width 5–45 mm; petiole 5–40 mm long. Peduncles 1–to cymosely few-flowered, usually slender, terete, less hairy than stem or sometimes glabrous, often 40–100 mm long, sometimes longer, rarely shorter; bracteoles lanceolate, linear or subulate, minute or up to 8 mm long, hairy; pedicels slender, usually more densely pubescent than stems, 5–25 mm long. Calyx silky villous outside, rarely nearly glabrous, 6–10 mm long; sepals broadly ovate to oblong, much imbricate, usually obtuse but often apiculate or mucronate, chartaceous (outer ones) to somewhat membranous (inner ones). Corolla

funnel-shaped, white inside and pale pink outside with greenish midpetaline areas or pink to pale rose, 15–35 mm long and as much in diameter, brownish strigose on midpetaline areas. Ovary glabrous. Capsule globose, glabrous, ± 8 mm in diameter. Seeds dark brown, glabrous, verrucose, 4–5 mm long. Flowering time August to December.

Very variable endemic, occurring from Namaqualand in the Northern Cape to the Western and Eastern Cape, in fynbos, grassland and karroid vegetation, on sandy, stony, clay and shale soils. Map 23.

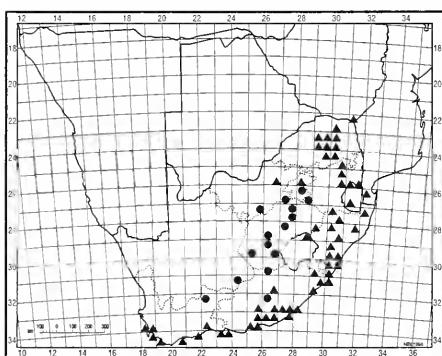
Distinguishing characters: leaves palmately nerved, corolla 15–35 mm long.

Vouchers: *Fourcade* 5741 (PRE); *Galpin* 4352 (GRA, PRE); *Howes* 175 (PRE); *Hugo* 1942 (PRE, STE).

7. ***Convolvulus dregeanus* Choisy** in A.DC., *Prodromus systematis naturalis* ... 9: 411 (1845); Hallier f.: 105 (1893a); Baker & C.H.Wright: 74 (1904); A.Meeuse: 671 (1957a); Retief & P.P.J.Herman: 380 (1997). Type: Northern Cape, Richmond (Winterveld), *Drège* 7828 (G, holo.; L!).

C. liniformis Rendle: 61 (1901); Baker & C.H.Wright: 71 (1904). Type: North-West, Mooi River, *Burke* 283 (PRE, SAM, iso.).

Perennial, totally glabrous, with several annual stems from a single thick taproot. Stems trailing or ascending to suberect, sometimes branched from base, very slender, up to ± 300 mm long. Leaves small, variable in shape, sometimes lanceolate to linear, often with 2 minute basal auricles, acute, nearly sessile, 4–40 mm long; lower leaves usually oblong to ovate-suborbicular, entire, subcordate or ± lobed, gradually changing upwards; upper leaves deeply palmately 3–5-fid with linear lobes of which the middle one is the longest and sometimes ± pinnatilobed, up to 25 mm long. petiole of upper leaves up to 10 mm long. Peduncles 5–45 mm long, 1-flowered; bracteoles lanceolate-linear to almost spathulate, ± 2



MAP 24.—● *Convolvulus dregeanus*
▲ *C. farinosus*

mm long, usually green and foliaceous; pedicels 1–5 mm long or occasionally peduncles reduced and pedicels up to \pm 10 mm long. *Calyx* 4–7 mm long; sepals much imbricate, obovate or the outer oblong, obtuse. *Corolla* 12–20 mm long, pinkish white or white. *Capsule* globose, \pm 6 mm wide. *Seeds* scabrid to muriculate, \pm 4 mm long. *Flowering time* November to March.

Endemic species found in the central parts of South Africa (absent from the Northern Province and KwaZulu-Natal) in short grassland on sandy clay or brackish soils and in disturbed areas. Map 24.

Distinguishing characters: plant quite glabrous, flowers solitary and pedunculate.

Vouchers: Acocks 16284 (PRE); Acocks 20833 (PRE); Verdoorn 899 (PRE).

8. ***Convolvulus farinosus* L.**, Mantissa plantarum 2: 203 (1771); Choisy: 412 (1845); Hallier f.: 104 (1893a); Baker & C.H.Wright: 74 (1904); Baker & Rendle: 98 (1905–06); T.M.Salter: 685 (1950); A.Meeuse: 684 (1957a); Verdc.: 41 (1963a); Compton: 474 (1976); Gonç.: 28, t. 8 (1987); Gonç.: 27, t. 8 (1992); Lejoly & Lisowski: 371, fig. 5 (1993b); Retief & P.P.J.Herman: 380 (1997). Type: Sweden (cultivated in Uppsala), specimen 218.6 (LINN, lecto.).

C. cordifolius Thunb.: 35 (1794); Choisy: 413 (1845). Type: Cape, Thunberg *s.n.* (U, holo.).

Herbaceous perennial. *Stems* many, long, slender, weak, climbing or prostrate and usually branched, pubescent or farinose-puberulous, younger shoots often silvery. *Leaves* usually cordate-deltoid or sagittate, acute with terminal mucro, rarely obtuse, subentire to irregularly and shallowly crenate, herbaceous drying membranous, glabrous above except when young, glabrous or somewhat pubescent beneath, distinctly net-veined; basal sinus broad, basal auricles rounded or pointed, sometimes with a few teeth; very rarely leaves with additional triangular lobes above basal auricles; blade 40–120 mm \times 30–90 mm; petiole up to 65 mm long, finely and densely pubescent. *Peduncles* as long as, or longer than subtending petiole, finely pubescent, subumbellately 1–6-flowered; bracts minute, linear or lanceolate, pubescent; pedicels short. *Sepals* unequal, oblong or elliptic (outer ones) to suborbicular (inner ones), much imbricate, acute or obtuse with terminal mucro, 6–8 mm long; 2 outer ones somewhat pubescent; 3 inner ones less pubescent to almost glabrous and wider. *Corolla* funnel-shaped, white, very pale pink or very pale pinkish mauve, 12–15 mm long; lobes short, tube rather narrow; mid-petaline areas hairy towards obtuse, mucronate tips of lobes. *Stamens* bearing short thick lateral papillae in their dilated basal portions; anthers dirty purple. *Ovary* glabrous. *Capsule* subglobose, shortly apiculate, glabrous, 5–8 mm wide, pale brown. *Seeds* usually 4, subtrigonous, 3.5–4.0 mm long, black, scabridulous-rugose. *Flowering time* throughout the year.

A common and occasionally weedy species in bushveld, grassland, forest margins and undergrowth, on river banks, on sand, loam and clay. Found in the northern, eastern and southern parts of southern Africa, but absent from Namibia, Botswana and the Northern Cape. Occurs further north in tropical and subtropical eastern Africa, Madagascar and the Mascarene Islands, also in the western Mediterranean area. Map 24.

Distinguishing characters: cordate-deltoid leaves and 12–14 mm long corolla.

Reported by Watt & Breyer-Brandwijk (1962: 306) to have medicinal uses.

Vouchers: *Boucher* 3477 (PRE, STE); *Culverwell* 1034 (PRE); *Meeuse* 9232 (PRE); *Moll* 4600 (NH, PRE); *Strey* 8650 (NH, PRE).

9. ***Convolvulus galpinii* C.H.Wright** in T. Dyer, *Flora capensis* 4.2: 75 (1904); A. Meeuse: 687 (1957a). Type: Eastern Cape, Queenstown, *Galpin* 2110 (K, holo!; BOL, GRA, PRE!).

Probably a perennial, whole plant densely villous or tomentose with fulvous or grey short hairs. *Stems* prostrate or twining, slender, terete, 600 mm long. *Leaves* sagittate-deltoid to deltoid-cordate or ovate-cordate, 20–40 mm long, usually somewhat irregularly crenate-serrate, usually acute, basal sinus wide; basal lobes often somewhat toothed or with angular small lobes; petiole up to \pm 12 mm long. *Peduncles* 1- or 2-flowered, slender, terete, up to 60 mm long; bracteoles linear, 5–8 mm long; pedicels up to \pm 10 mm long. *Calyx* 6–10 mm long; outer sepals ovate, abruptly acuminate, villous; inner ones shorter and relatively broader, ovate-orbicular, less hairy. *Corolla* funnel-shaped, white, 16–20 mm long and \pm as wide; midpetaline areas densely silvery. *Capsule* subglobose, glabrous, apiculate, 6–8 mm wide. *Seeds* dark brown, 4–5 mm long, subpuberulous with fine, yellowish

brown rugosities of the testa. *Flowering time* December to March.

Rare endemic growing in grassland on sandy soil on mountains in the Eastern Cape. Map 25.

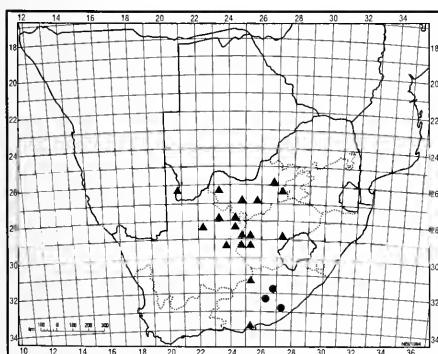
Closely related to *C. natalensis* (no. 11) or perhaps only a form of it. *C. galpinii* can be separated by its abruptly acuminate and shorter sepals, smaller corollas, more slender, often twining stems and usually smaller, often sagittate or deltoid-cordate leaves and puberulous seeds.

Vouchers: *Leighton* 2665 (BOL, PRE); *Roberts* 2028 (PRE).

10. ***Convolvulus multifidus* Thunb.**, *Prodromus plantarum capensium* ... 1: 35 (1794); Thunb.: 170 (1820); Choisy: 410 (1845) excl. spec. *Burchell* 2412; Baker & C.H. Wright: 76 (1904); A. Meeuse: 675 (1957a); Retief & P.P.J. Herman: 380 (1997). Type: Eastern Cape, Uitenhage, Loeri River, *Thunberg* s.n. (UPPS, holo., PRE, photo!).

C. thunbergii Hallier f.: 102 (1893a), non Roem. & Schult.

Perennial forming annual stems from a woody rootstock. *Stems* few to many, suberect to prostrate, herbaceous but firm, suffruticose at base, slender, terete, covered (like all young vegetative parts, pedicels, bracteoles and calyx) with a dense villous, tomentose to somewhat silvery pubescence, 150–750 mm long. *Leaves* palmately 5-fid with at least the central lobe irregularly pinnatifid or pinnatisect and basal lobes hastate and bifid, ovate or oblong in outline, 5–35 mm long; ultimate segments always narrow, usually narrower than 2 mm, often with revolute edges or \pm concave; upper surface glabrescent, lower surface persistently densely hairy, tomentose or villous; petiole short, up to \pm 10 mm long in largest leaves. *Peduncles* 1-flowered, up to 20 mm long, sometimes absent; bracteoles small, linear-subulate; pedicels longer than peduncles, up to 15 mm. *Sepals* broadly ovate; outer ones 5.5–7.0 mm long, often somewhat thinner and crisped along edges, obtuse or acute; inner ones usually short-



MAP 25.—● *Convolvulus galpinii*
▲ *C. multifidus*

er, relatively broader, membranous-coriaceous, glabrous or nearly so except at apex, innermost mucronate to apiculate. *Corolla* funnel-shaped, very pale pink or white, 10–12 mm long, 12–15 mm wide; lobes rounded to obtuse; midpetaline areas densely silky. *Capsule* subglobose or ovoid-globose, apiculate, glabrous, ± 5 mm wide. *Seeds* very dark brown or black, glabrous, somewhat longitudinally rugose on back, verrucose-muriculate on angles. *Flowering time* October to April.

Endemic species concentrated in the central parts of South Africa in North-West, the Free State and Northern and Eastern Cape. It is found in deep sandy or dry rocky soil or limestone, along roadsides, in grassland and karroid vegetation and also on the banks of dry riverbeds. Map 25.

The usually manifest, up to 20 mm long peduncles and larger corolla distinguish this species from the closely related *C. boedeckerianus* (no. 5) and *C. ocellatus* (no. 12). The latter species may even prove to be conspecific.

Vouchers: *Brueckner* 150 (PRE); *Germishuizen* 3974 (PRE); *Reid* 350 (PRE).

11. ***Convolvulus natalensis* Bernh. ex Krauss** in Flora, oder allgemeine botanische Zeitung, Jena, Regensburg 27: 829 (1844); Hallier f.: 105 (1893a); Baker & C.H.Wright: 77 (1904); A.Meeuse: 687 (1957a); A.Batten & G.W.Bokelmann: 123, t. 98 (1966); Compton: 475 (1976); A.Meeuse & W.G.Welman: 47 (1996); Retief & P.P.J.Herman: 380 (1997). Type: KwaZulu-Natal, Pietermaritzburg, Table Mountain, Krauss 465 (B, holo.†?; BOL, iso.!).

C. calycinus E.Mey. ex Drège: 154 (1838) nomen tantum; E.Mey. ex Choisy: 408 (1845), non Roxb., nec. Humb., Bonpl. & Kunth; Hallier f.: 105 (1893a); Baker & C.H.Wright: 77 (1904). Type: KwaZulu-Natal, Urmizimku, Clydesdale, Drège s.n. (L, iso.).

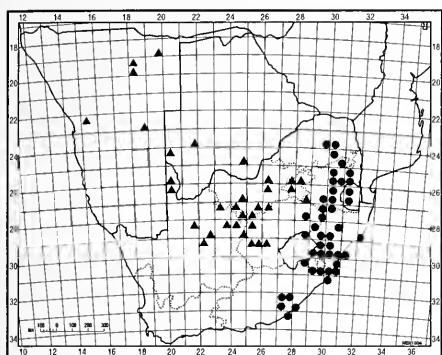
C. transvaalensis Schltr.: 502 (1896). *C. natalensis* Bernh. ex Krauss var. *transvaalensis* (Schltr.) A.Meeuse: 689 (1957a); Retief & P.P.J.Herman: 380 (1997). Type: Mpumalanga. Barberton, Galpin 430 (BOL, GRA, PRE!, iso.).

C. bullerianus Rendle: 62 (1901); Baker & C.H.Wright: 77 (1904). Type: KwaZulu-Natal, Estcourt, Mooi River. J.M. Wood 6206 (PRE, iso.!).

C. natalensis Bernh. ex Krauss var. *integrifolia* C.H.Wright: 77 (1904). Type: Lesotho, Cooper 929 (BOL, holo.!).

C. natalensis Bernh. ex Krauss var. *angustifolia* C.H.Wright: 77 (1904). Type: KwaZulu-Natal, Kokstad, Haygarth in Herb. J.M. Wood 4179 (BOL, NH, iso.!).

Perennial forming prostrate or rarely almost twining annual stems from a woody taproot. *Stems* usually rather stout and firm, terete, up to 1 m long, covered (as are all vegetative parts, peduncles, pedicels, bracteoles and calyx) with rather short hairs which are sometimes stiff and hirsutulous, sometimes silky or ± woolly, fawn, rust-brown to silvery white, more densely so in all younger parts, at length glabrescent. *Leaves* linear to cordate-ovate, cordate-oblong or sometimes cordate or narrowly reniform, 10–90 mm × 7.5–50.0 mm, usually undissected with an undulate, crenate or nearly dentate or serrate to subentire margin but sometimes faintly, rarely distinctly and irregularly pinnatifolbed; apex usually broadly rounded and shortly cuspidate, sometimes obtuse or acute; basal sinus, if present, broad and shallow, basal auricles often almost angular; petiole 5–20 mm long. *Peduncles* 1- to few-flowered, terete, short (up to 70 mm long), occasionally absent; bracteoles linear or lanceolate, 6–10 mm long, often more than 2 when inflorescence few-flowered; pedicels very short or up to 15 mm long. *Calyx* 10–18 mm long; sepals ovate-lanceolate, oblong, elliptic or lanceolate, ± unequal; outer ones herbaceous, sometimes subcordate at base, broader and crisped along margins; inner ones a little shorter and less pubescent to glabrous, marcescent, sometimes broadly ovate; all sepals obtuse to acute, inner usually more acute than outer ones. *Corolla* white, cream-coloured or white tinged with green, funnel-shaped, 20–35 mm long, 22–40 mm wide; midpetaline areas greenish, densely silky with rust-brown, fawn or silvery white hairs. *Capsule* subglobose, or almost ovoid, apiculate, glabrous, 8–10 mm long and wide. *Seeds* dark brown, glabrous, distinctly verrucose-rugose, 5–6 mm long. *Flowering time* August to March.

MAP 26.—● *Convolvulus natalensis*▲ *C. ocellatus*

Endemic species found in the eastern parts of southern Africa in the Northern Province, Mpumalanga, Swaziland, KwaZulu-Natal and the Eastern Cape, in grassland on stony, clay, sandy or loamy soils. Map 26.

There are intermediates between the two varieties distinguished in Meeuse (1957a) and their distribution ranges overlap. The differences in leaves and sepals do not warrant the retention of two varieties (which may conceivably belong to a single population). See also under *C. galpinii* (no. 9). Distinguishing characters: undissected, hairy, cordate or cordate-oblong, crenate leaves and 20–35 mm long corolla.

Vouchers: Codd 8056 (PRE); Coleman 527 (NH, PRE); Compton 26149 (PRE); Paton 342 (PRE); Thode A1176 (NH, PRE).

12. ***Convolvulus ocellatus* Hook.** in Curtis's Botanical Magazine 70: t. 4065 (1844a); Choisy: 404 (1845); Hallier f.: 102 (1893a); Baker & C.H.Wright: 71 (1904); A.Meeuse: 672 (1957a); Roessler: 4 (1967a); Gonç.: 26 (1987); A.Meeuse & W.G.Welman: 48 (1996); A.Fabian & Germish.: 334, t. 159a (1997); Retief & P.P.J.Herman: 381 (1997). Iconotype: illustration in *Curtis's Botanical Magazine* 70: t. 4065 (1844); Transvaal, Magaliesberg, Burke 119 (PRE, topo!).

C. ornatus Engl.: 247 (1888); Baker & C.H.Wright: 76 (1904). *C. ocellatus* Hook.f. var. *ornatus* (Engl.) A.Meeuse: 673 (1957a); Retief & P.P.J.Herman: 381 (1997). Type: Northern Cape, Kimberley, Marloth 716 (B, holo.†; PRE!).

C. multifidus Hallier f.: 102 (1893a) non Thunb. (1794). Type: Northern Cape, Kuruman, Burchell 2412 (K, holo.).

C. dinteri Pilg.: 219 (1910); Dinter: 240 (1919). Type: Namibia, Aukas, Krejfontein, Dinter 812 (SAM, PRE!, iso.).

Perennial, forming much-branched erect to decumbent, annual stems from a woody rootstock. *Stems* several from base, densely brownish, greyish or sericeo-tomentose, more rarely white-pubescent, up to ± 600 mm long, occasionally climbing at ends. *Leaves* varying from linear-oblong with hastate or sagittate base, with or without basal auricles, to palmately 5-fid, 9–30 × 2–8 mm; covered (as are all vegetative parts, calyx and midpetaline zones) with the same brownish or greyish tomentum as the stems; petiole up to 5 mm long. *Peduncles* 0–10 mm long, 1- or rarely 2-flowered; bracteoles linear to subulate, 3–5 mm long, sometimes minute. *Calyx* 6–10 mm long; sepals ovate to oblong, acute to acuminate, occasionally obtuse; outer ones completely covered with tomentum on outside; inner ones with a median hairy zone. *Corolla* white or pink to pale mauve, with a dark purple centre, widely funnel-shaped, 12–20 mm long, 12–25 mm wide. *Capsule* globose to ovoid-conical, shortly apiculate, apex glabrous or hairy. *Seeds* dark brown, glabrous. *Flowering time* October to April.

Widespread from Namibia and Botswana to the central parts of South Africa, mainly North-West, Gauteng, the Northern Cape and Free State; also in Zimbabwe. In grassland and bushveld, often on red sandy soil. Map 26.

This taxon is very variable and the extreme forms have been described as varieties, but there are many transitional specimens, those from the drier areas tending to form more dissected leaves and a denser tomentum. Distinguishing characters: densely tomentose or sericeous plant, thick leaves with revolute margins, 12–20 mm long corolla.

Vouchers: *Acocks* 1461 (PRE); *Coetze* 500 (PRE); *Germishuizen* 4907 (PRE); *Merxmüller & Giess* 1160 (M, PRE, WIND); *Skarpe* 201 (PRE).

13. ***Convolvulus sagittatus* Thunb.**, *Prodromus plantarum capensis* ... 1: 35 (1794); *Choisy*: 407 (1845); *Hallier* f.: 103 (1893a); *Hallier* f.: 533 (1898a); *Baker & C.H.Wright*: 72 (1904); *Baker & Rendle*: 96 (1905–06) pro parte excl. var. *abyssinicus* (*Hallier* f.) *Rendle*; *A.Meeuse*: 679 (1957a); *Verdc.*: 43 (1963a); *Roessler*: 5 (1967a); *Gonç.*: 27 (1987); *Gonç.*: 26: (1992); *Lejoly & Lisowski*: 372 (1993b); *A.Meeuse & W.G.Welman*: 48 (1996); *Retief & P.P.J.Herman*: 381 (1997). Type: Cape, *Thunberg* (sheet 1 only) (U, lecto., PRE, photo.!).

C. ulosepalus *Hallier* f.: 103 (1893a); *Baker & C.H.Wright*: 73 (1904); *Baker & Rendle*: 95 (1905–06); *T.M.Salter*: 685 (1950); *A.Meeuse*: 678 (1957a); *M.D.Hend. & J.G.Anderson*: 244 (1966); *Compton*: 475 (1976). *C. sagittatus* Thunb. var. *ulosepalus* (*Hallier* f.) *Verdc.*: 346 (1957a); *Verdc.*: 44 (1963a); *J.Adams*: t. 120 (1976). Type: Northern Cape, Richmond, *Drège* 7829a (L, lecto.!).

C. sagittatus Thunb. var. *grandiflorus* *Hallier* f.: 533 (1898a). *C. sagittatus* Thunb. subsp. *grandiflorus* (*Hallier* f.) *A.Meeuse* var. *grandiflorus*: 683 (1957a). Type: not designated.

C. sagittatus Thunb. var. *grandiflorus* *Hallier* f. subvar. *graminifolius* *Hallier* f.: 534 (1898a). *C. sagittatus* Thunb. var. *graminifolius* (*Hallier* f.) *Baker & C.H.Wright*: 72 (1904). *C. sagittatus* Thunb. subsp. *grandiflorus* (*Hallier* f.) *A.Meeuse* var. *graminifolius* (*Hallier* f.) *Baker & C.H.Wright* ex *A.Meeuse*: 683 (1957a). Type: KwaZulu-Natal, Camperdown, *Rehmann* 7823 (Z, holotype!).

C. sagittatus Thunb. var. *grandiflorus* *Hallier* f. subvar. *lineariifolius* *Hallier* f.: 534 (1898a). *C. sagittatus* Thunb. var. *lineariifolius* (*Hallier* f.) *Baker & C.H.Wright*: 72 (1904). *C. sagittatus* Thunb. subsp. *grandiflorus* (*Hallier* f.) *A.Meeuse* var. *lineariifolius* (*Hallier* f.) *Baker & C.H.Wright* ex *A.Meeuse*: 683 (1957a). Type: Mpumalanga, Barberton, Abbots Hill, *Galpin* 1037 (Z, holotype!); PRE, BOL, GRA, NH, SAM, iso!.

C. phyllosepalus *Hallier* f.: 535 (1898a); *Baker & C.H.Wright*: 75 (1904). *C. sagittatus* Thunb. subsp. *sagittatus* var. *phyllosepalus* (*Hallier* f.) *A.Meeuse*: 681 (1957a); *A.E.van Wyk & S.Malan*: 52 (1988). Type: Free State, Bloemfontein, *Rehmann* 3796 (Z, lecto.!).

C. hirtellus *Hallier* f.: 536 (1898a). *C. sagittatus* Thunb. subsp. *sagittatus* var. *hirtellus* (*Hallier* f.) *A.Meeuse*: 682 (1957a); *A.E.van Wyk & S.Malan*: 52 (1988). Type: Free State, Vaal River, *Burke* s.n. (K, lecto.!).

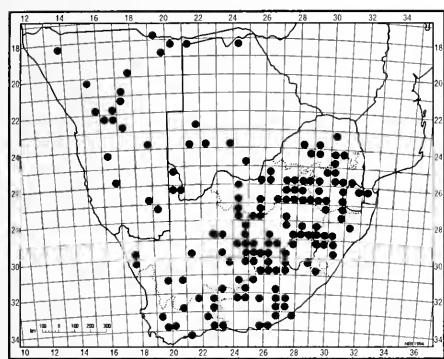
C. sagittatus Thunb. subsp. *sagittatus* var. *namaquensis* *A.Meeuse*: 682 (1957a). Type: Northern Cape, Namaqualand, Brakdam, *Schlechter* 11124 (PRE, holotype!); BOL, GRA; L, WAG, iso!.

Extremely variable perennial, forming several annual stems from a long thin perennial taproot. Stems usually branched only from base, slender, prostrate or occasionally in some forms climbing, usually hairy, usually shorter than 600 mm, but in some forms attaining 1–2 m. Leaves varying from linear or linear-sagittate to hastate-sagittate or oblong with truncate base, usually entire except the often bifid basal lobes, usually somewhat hairy, sometimes densely so or nearly to quite glabrous; petiole usually very short and often hairy. Peduncles 1-flowered or in some forms few-flowered, usually terete, slender, up to 45 mm long, often hairy; bracteoles small; pedicels short or occasionally up to 30 mm long. Calyx usually hairy; sepals varying from lanceolate to orbicular, acute to obtuse, sometimes mucronate or ciliate, 5–9 mm long. Corolla funnel-shaped, white, pale pink or mauve-pink, sometimes with darker pink to reddish purple centre; midpetaline areas hairy near tips, 8–25 mm long. Capsule subglobose, 6–7 mm long, glabrous. Seeds usually 4, dark brown or black, glabrous when ripe, somewhat tuberculate-rugose, 3.5 × 2.5 mm. Flowering time throughout the year, mostly September to May.

Widespread in Africa south of the Sahara, also in Arabia and probably also in Madagascar. Common throughout southern Africa in bushveld and grassland on various soils; often recorded as a weed difficult to eradicate. Map 27.

Distinguished by its leaves which are at least 3 times as long as broad and the corolla which is 2–3 times as long as the calyx. It is noteworthy that most of the varieties previously described are not geographically restricted to small areas, but have a wide range. Without extensive field and experimental studies, it is impossible to delimit varieties in this entangled assembly.

Reported by Watt & Breyer-Brandwijk (1962: 306) as having medicinal use.

MAP 27.—*Convolvulus sagittatus*

Vouchers: Galpin 13223 (BOL, PRE); Killick & Marais 1998 (PRE); Meeuse 9030 (PRE); Theron 60 (PRE); Volk 2364 (M, PRE, WIND).

14. *Convolvulus thunbergii* Roem. & Schult., *Systema vegetabilium ... 4: 268 (1819)*; Drège: 46 (1843); A.Meeuse: 690 (1957a); Letty: 273, t. 136 (1962); Retief & P.P.J.Herman: 381 (1997). Type: Cape, in *Herb. Thunberg s.n.* (UPPS, holo.).

Perennial forming several prostrate annual stems from a thin woody rootstock. Stems slender or occasionally ± stout, herbaceous but firm, terete, covered with rust-brown or fawn, rarely silvery white short stiff hairs, up to ± 700 mm long. Leaves oblong in outline, varying to lanceolate or ovate, cordate to hastate or truncate at base, undivided and crenate to almost pinnatifolied or usually palmately 5-lobed with middle lobe the longest and all lobes crenate to pinnatifid or even bipinnatifid or whole leaf somewhat palmately bipinnatifid, ultimate lobes

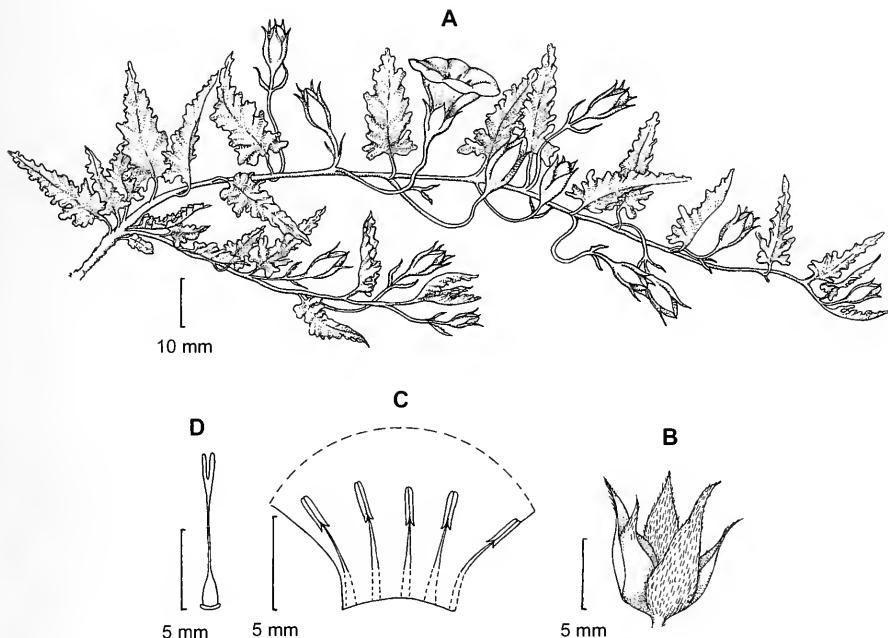
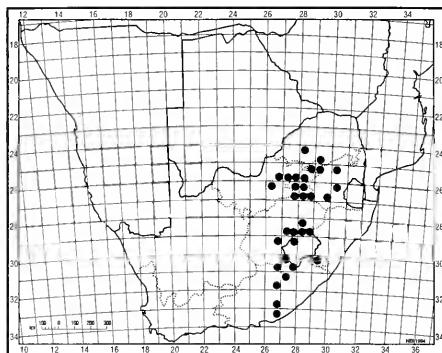


FIGURE 8.—*Convolvulus thunbergii*: A, flowering stem (Marais 1059, PRE); B, calyx; C, inside of corolla tube with stamens; D, ovary, style and stigmas (Coetze 428, PRE). Artist: Marietjie Steyn.

sometimes very fine; blade 20–50 × 5–30 mm, apex acute or occasionally obtuse; both surfaces thinly to densely covered with the same hairs as stems, especially on nerves; petiole hairy like stems, slender, up to 10 mm, rarely 18 mm long. *Peduncles* 1- or 2-flowered, slender, terete, hairy like stems as are bracteoles and pedicels, 10–40 mm long; bracteoles subulate or linear-subulate, 6–9 mm long or sometimes minute; pedicels up to 15 mm long. *Calyx* with short, stiff hairs outside as on vegetative parts; sepals unequal; outer ones herbaceous to chartaceous, ovate, ovate-lanceolate or elliptic, acuminate, usually very acute, 8–15 mm long; inner ones less hairy, distinctly shorter, suborbicular, somewhat marcescent. *Corolla* white or pale pink, funnel-shaped, 18–25 mm long, 20–30 mm wide; midpetaline areas greenish, usually very densely hairy towards apex outside. *Capsule* subglobose, apiculate, glabrous, 7–9 mm wide. *Seeds* black, glabrous, very minutely punctate, ± 5 mm long. *Flowering time* September to April, mostly October and November. Figure 8.

This species is endemic to the central parts of southern Africa (not in Namibia, Botswana, Swaziland, the Northern and Western Cape). Usually found in grassland on sandy, loamy or even clay as well as stony soils; also found as a weed along roadsides and in other disturbed places. Map 28.



MAP 28.—*Convolvulus thunbergii*

Distinguished by its pinnately nerved, linear to linear-oblong leaves and fairly large flowers with corolla up to 25 mm long. *C. thunbergii* is most closely related to or perhaps even conspecific with *C. natalensis* (no. 11). The varieties distinguished by Meeuse (1957a) in *C. natalensis* sometimes approach *C. thunbergii* very closely.

Vouchers: *Dieterlen* 387 (GRA, NH, PRE, SAM); *Flanagan* 1507 (BOL, PRE, SAM); *Galpin* 13955 (BOL, PRE); *Liebenberg* 8395 (PRE); *Schlechter* 3793 (BOL, GRA, NH, PRE).

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9. CALYSTEGIA

Calystegia R.Br., Prodromus florae novae hollandiae ...: 483 (1810), *nomen gener. conserv.*; Peter: 36 (1891); Hallier f.: 580 (1893b); Hallier f.: 110 (1893a); Baker & Rendle: 99 (1905–06); E.Phillips: 511 (1926); Ooststr.: 284 (1939); Ooststr.: 437 (1953); A.Meeuse: 696 (1957a); Brummitt: 78 (1972); R.A.Dyer: 504 (1975). Type species: *C. sepium* (L.) R.Br.

Volvulus Medik.: 42 (1791a); Medik.: 202 (1791b).

Convolvulus L., auct. pro parte; T.M.Salter: 685 (1950).

Perennial rhizomatous herbs. Stems procumbent or climbing, white latex present. Leaves petiolate, variously lobed at base. Flowers solitary, axillary, with a pair of large and sometimes inflated bracteoles partly or entirely concealing calyx. Corolla medium-sized to large, white to pinkish, infundibuliform or tubiform, glabrous or ciliate. Pollen globose, ± smooth, pantoporate. Ovary glabrous, 1-locular; ovules 4; stigma bilobed, lobes swollen and elongate. Seeds black, smooth or verrucose.

About 25 species in the temperate and tropical regions of both hemispheres. Two species in South Africa, rare and local on the southern coast, one introduced.

Leaves hastate-sagittate, ± acute; climbing plant with subacute bracts 1. *C. sepium* *
Leaves reniform, obtuse; prostrate plant with obtuse bracts 2. *C. soldanella*

1. ****Calystegia sepium* (L.) R.Br.**, Prodromus florae novae hollandiae ...: 483 (1810); Choisy: 433 (1845); A.Meeuse: 697 (1957a); Brummitt: 78 (1972); Ross-Craig: t. XXI/22 (1979). Type: The original description was based on Bauhin, Pinax 294 (1671) but the species is also represented in the Linnean Herbarium and that specimen may be taken to represent the lectotype.

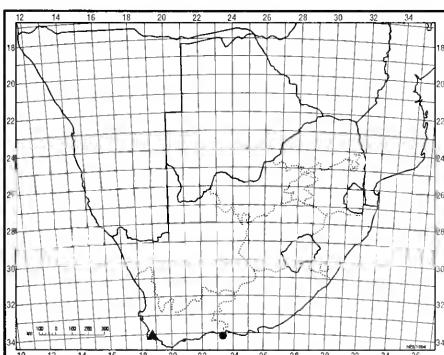
Convolvulus sepium L.: 153 (1753); T.M.Salter: 685 (1950).

Usually glabrous perennial herb. Stems terete, strongly twisting and climbing, 1–3 m long. Leaves triangular in outline, sagittate or hastate-sagittate, 40–120 mm long and 20–60 mm wide at base, apex acute or acuminate, basal lobes slightly divergent, obliquely truncate or acute, often almost angulate; petiole 10–50 mm long. Peduncles 1-flowered, longer than leaves; bracteoles ovate or ovate-cordate, acute or subobtuse, ± 18 mm long, longer than calyx and almost concealing it. Sepals broadly lanceolate, very pale green, up to 10 mm long. Corolla funnel-shaped, white or pink, 50–55 mm long, with short obtuse lobes. Stamens 15–30 mm long;

anthers 4.0–6.5 mm long. Capsule subglobose. Flowering time December and January.

A native of Europe and North and South America, introduced as a weed elsewhere. Very rare and local in the Cape Peninsula. Map 29.

Distinguished by its sagittate leaves and 50–55 mm long corolla. Brummitt (1972) de-



MAP 29.—● *Calystegia soldanella*
▲ *C. sepium*

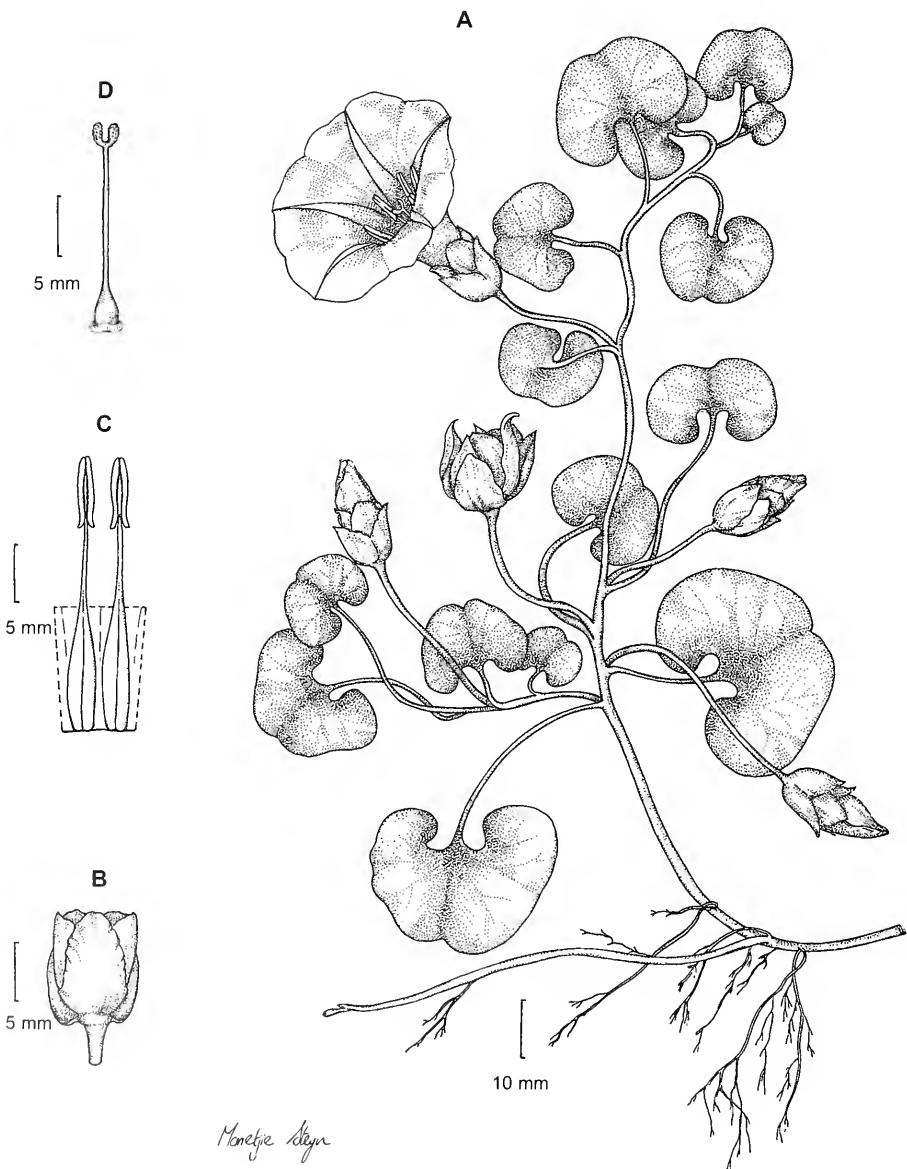


FIGURE 9.—*Calystegia soldanella*: A, flowering stem (*Taylor 4441, PRE*); B, calyx; C, stamens; D, ovary, style and stigmas (after Stella Ross-Craig 1979). Artist: Marietjie Steyn.

scribed a number of subspecies. It appears that the South African material belongs to the typical subspecies.

Vouchers: *Moss* 7497 (BOL, J); *Salter* 889 (BOL).

2. ***Calystegia soldanella* (L.) R.Br. ex Roem. & Schult.**, *Systema vegetabilium* ... 4: 184 (1819); *Choisy*: 433 (1845); *A.Meeuse*: 697 (1957a); *Brummitt*: 78 (1972); *Ross-Craig*: t. XXI/23 (1979). Type: Linnaeus based this species on Bauhin's *Pinax* 295 (1671), but the species is also represented in the Linnean Herbarium and this specimen may be taken to represent the lectotype.

Convolvulus soldanella L.: 159 (1753).

Glabrous, straggling perennial herb. *Stems* procumbent, slender, up to 500 mm long, not or weakly twisting, from a 100–600 mm long rhizome. *Leaves* somewhat fleshy, reniform, with deep basal sinus and rounded basal lobes, 10–40 mm long and wide, but usually \pm 20 mm

wide, apex obtuse or emarginate, \pm repand; petiole usually longer than blade. *Peduncles* mostly longer than leaves, sharply quadrangular; bracteoles ovate to suborbicular, flat or sometimes tending to invest calyx, slightly shorter than calyx, 10–15 mm long. *Corolla* 24–40 mm long, pink, mauve or pale purple. *Stamens* 20–30 mm; anthers 4–6 mm. *Capsule* ovoid, acute. *Flowering time* November and December. Figure 9.

Occurs on the coast of western and southern Europe, northern and southern Africa, Asia, Australia and North and South America. Found only in sandy places near the seashore, mostly on calcareous soil, its seeds distributed by sea currents (Muir 1934: 44). May cover large patches on account of vegetative reproduction (runners). Very rare and local on the southern Cape coast. Map 29.

Distinguished by its reniform leaves and 24–40 mm long corolla.

Vouchers: *Keet* 861 (GRA, PRE); *Muir* 4857 (K); *Taylor* 4441 (PRE, STE).

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10. HEWITTIA

Hewittia Wight & Arn. in Madras Journal of Literature and Science 1,5: 22 (1837); Peter: 32 (1891); Baker & C.H.Wright: 68 (1904); Baker & Rendle: 100 (1905–06); E.Phillips: 623 (1951); Ooststr.: 438 (1953); A.Meeuse: 698 (1957a); Verde.: 44 (1963a); R.A.Dyer: 504 (1975); Gonç.: 30 (1987); Gonç.: 30 (1992); Lejoly & Lisowski: 373 (1993b). Type species: *H. malabarica* (L.) Suresh.

Shutereia Choisy: 485 (1834); Choisy: 435 (1845); Ooststr.: 286 (1939), non *Shuteria* Wight & Arn. (1834) nom. conserv. *Eremosperma* Chiouv.: 143 (1936); Verde.: 321 (1958a).

Twining or prostrate, ± pubescent, perennial herb. *Stems* slender, 1–3 m long, angular, occasionally rooting at nodes. *Leaves* very variable, oblong or ovate to broadly ovate, 25–140 × 12–100 mm, apex obtuse to acuminate, mucronulate, base cordate, hastate, cuneate or sometimes truncate, margin entire to grossly dentate, both surfaces adpressed-pubescent to nearly glabrous, auricles entire or angular, occasionally spreading and blade ± hastate; petiole pubescent, 10–60 mm long. *Peduncles* 5–100 mm long, pubescent, axillary, 1-flowered or sometimes bearing 2 or 3 flowers in a bracteate cyme; pedicels usually short, up to 3 mm long (in fruit 5 mm); bracteoles oblong or linear-lanceolate, acuminate, 5–17 mm long. *Sepals* 5, lanceolate to ovate, acute, up to 17 mm long, ± hairy and ciliate, herbaceous; outer ones large, accrescent and nervose in fruit; inner ones smaller. *Corolla* campanulate to funnel-shaped, 20–35 mm long, pale yellow or white, usually with maroon or purple centre, limb with 5 very short, rounded, emarginate, mucronulate lobes; mid-petaline areas pilose outside. *Stamens* 5, included; filaments linear with dilated base; pollen smooth. *Disc* annular. *Ovary* densely hairy with long white hairs, also a few long hairs on basal part of style, 1-locular or imperfectly 2-locular at apex, 4-ovuled; style simple, filiform, included; stigmas 2, ovate-oblong, flattened. *Capsule* 1-locular, depressed-globose to ± quadrangular, crowned by persistent style, pilose, 8–10 mm long, 4-valved, 4-seeded or, by abortion, with fewer seeds. *Seeds* 2–4, black, opaque, glabrous except for pubescent hilum, 5–6 mm long. *Flowering time* throughout the year, mostly August to January.

A small genus, possibly with a single species widespread in the tropics and subtropics of the Old World.

Hewittia malabarica (L.) Suresh in Nicolson, Suresh & Manilal, An interpretation of Van Rheede's Hortus malabaricus: 88 (1988); A.Meeuse & W.G.Welman: 48 (1996). Iconotype: Rheede, Horti malabarici pars undecima ... 11: 105, t. 51 (1692).

Convolvulus malabaricus L.: 155 (1753).

C. scandens Milne: 2 (1773). *H. scandens* (Milne) Maberley: 84 (1980); Gonç.: 31, t. 9 (1987); Gonç.: 30, t. 9 (1992); Lejoly & Lisowski: 373, fig. 6 (1993b). Iconotype: Rheede, Horti malabarici pars undecima ... 11: t. 64 (1692).

C. sublobatus L.f.: 135 (1782). *H. sublobata* (L.f.) Kuntze: 441 (1891); Hallier f.: 111 (1893a); J.M.Wood: 12, t. 281 (1902); A.Meeuse: 698 (1957a); Verde.: 45, fig. 12 (1963a); B.Jeppe: 64, t. 38 (1975); Compton: 475 (1976);

Retief & P.P.J.Herman: 382 (1997). *Shutereia sublobata* (L.f.) House: 318 (1906). Type: 'habitat in India', no recognised type specimen could be located.

C. bicolor Vahl: 25 (1794) non Desr. (1789), nom. illegit. *Shutereia bicolor* (Vahl) Choisy: 486 (1834). *H. bicolor* (Vahl) Wight & Arn.: 22 (1837); Baker & C.H.Wright: 68 (1904); Baker & Rendle: 100 (1905–06). Type: 'Ind. Orient.' Schumann (not found at C).

Description as for the genus. Figure 10.

Hewittia malabarica is found throughout tropical Africa and Asia, extending eastwards into Polynesia. It is introduced in Jamaica and probably other areas in the New World. In the FSA area, it occurs in Swaziland, the Northern Province, Mpumalanga, KwaZulu-Natal and

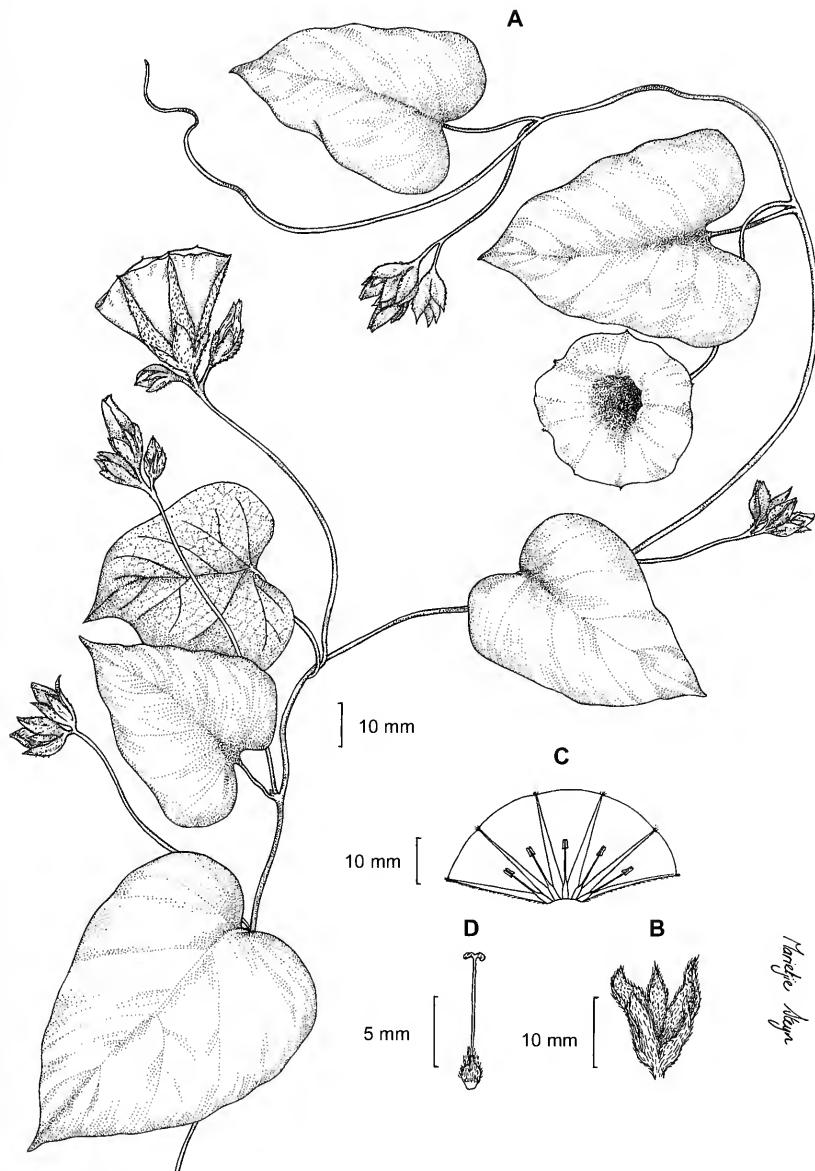
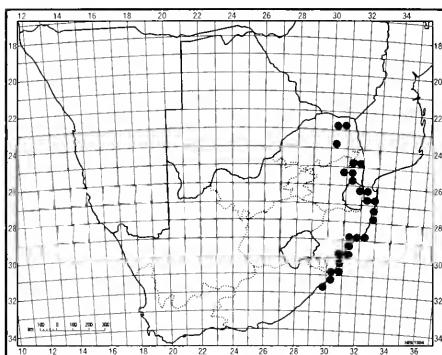


FIGURE 10.—**Hewittia malabarica**: A, flowering stem (*Netshuangani* 662, PRE); B, calyx; C, inside of corolla tube with stamens; D, ovary, styles and stigmas (*Arnold* 1426, PRE). Artist: Marietjie Steyn.

the Eastern Cape, but does not seem to occur in Namibia, as stated by Meeuse (1957a: 698) (see Roessler 1967a: 6). In southern Africa it grows in grassland, in coastal forest and scrub, in bushveld and along stream banks. According to Wells *et al.* (1986: 285) it can also be a ruderal or agrestal weed. Map 30.

Distinguished by its pale yellow or white corolla with a maroon or purple centre and also the entire leaves (see *Merremia*).

Vouchers: Culverwell 1058 (PRE); Flanagan s.n. (PRE); Meeuse 9222 (PRE); Mogg 12075 (PRE).



MAP 30.—*Hewittia malabarica*

6997000

11. MERREMPIA

Merremia Dennst., Schlüssel zum Hortus indicus malabaricus: 12, 34 (1818) nomen nudum, ex Hallier f.: 581 (1893b); Peter: 377 (1895); Baker & Rendle: 101 (1905–06); Ooststr.: 292 (1939); E. Phillips: 623 (1951); Ooststr.: 439 (1953); A. Meeuse: 700 (1957a); Verdc.: 48 (1963a); Roessler: 18 (1967a); R. A. Dyer: 504 (1975); Gonç.: 34 (1987); Gonç.: 34 (1992); Lejoly & Lisowski: 25 (1992). Type species: *M. convolvulacea* Dennst. ex Hallier f.

Herbs or small shrubs, usually twiners, often prostrate, rarely suberect. *Stems* terete, more rarely winged. *Leaves* usually petiolate, variable in shape and size, entire, dentate, auricled, lobed or palmately or pedately partite to compound. *Flowers* axillary, solitary or in few- to many-flowered axillary inflorescences, small to rather large, usually cymose. *Bracts* usually small. *Sepals* 5, usually subequal, elliptic to lanceolate, orbicular to ovate or oblong, acute or obtuse, herbaceous to coriaceous, sometimes accrescent. *Corolla* funnel-shaped or campanulate, entire or slightly 5-lobed, rarely deeply 5-lobed, mostly with distinct midpetaline areas, white or yellow to orange, often with darker brownish or purplish centre. *Stamens* included; filaments filiform, often broadened at base, often unequal; anthers often spirally contorted; pollen smooth, ellipsoid. *Disc* saucer-shaped. *Ovary* 2–4-locular, 4-ovuled; style simple, filiform, included; stigma biglobose. *Capsule* 1–4-locular, 4-valved or dehiscing irregularly, sometimes also circumscissile at base. *Seeds* 4, or fewer by abortion, glabrous or pubescent, especially on the angles.

A genus of about 80 species widespread in the tropics of both hemispheres; nine species occurring in southern Africa, four of them endemic.

Apart from having smooth pollen, *Merremia* differs from *Ipomoea* (and the closely related *Astripomoea* and *Stictocardia*) in the mostly cream to yellow colour of the corolla. These other genera usually have pink or mauve to deep magenta, red or blue corollas, if not white; yellow is very rare in *Ipomoea*.

- 1a Calyx turbinate, pale green, with 6 or 7 conspicuous, longitudinal, purplish red raised veins on concave outer sepals, purple-dotted between veins, enlarged in fruit 9. *M. verecunda*
- 1b Calyx without raised purplish veins and purple dots, usually not much enlarged in fruit:
 - 2a Stems distinctly winged; lobes of palmatilobed leaves mostly ovate; sepals \pm 10 mm long; corolla \pm 35 mm long 8. *M. pterygocallos*
 - 2b Stems not distinctly winged:
 - 3a Leaves entire or 3–5-lobed, but not deeply pinnately or palmately dissected (if oblong to lanceolate, then much longer than broad, with hastate-sagittate or truncate base, see *Xenostegia*) 4. *M. malvaefolia*
 - 3b Leaves deeply pinnately or palmately dissected (lobes often lobed again or variously dissected):
 - 4a Leaves sessile, cristately pinnatifid with \pm 1 mm broad rhachis parts and segments 7. *M. pinnata*
 - 4b Leaves usually manifestly petiolate, palmatifid:
 - 5a Leaf segments (sub)entire 6. *M. palmata*
 - 5b Leaf segments dentate (usually coarsely so) to pinnate:
 - 6a Plant with stiff, pilose-setose patent hairs on vegetative parts and calyx 2. *M. guerichii*
 - 6b Plant glabrous:

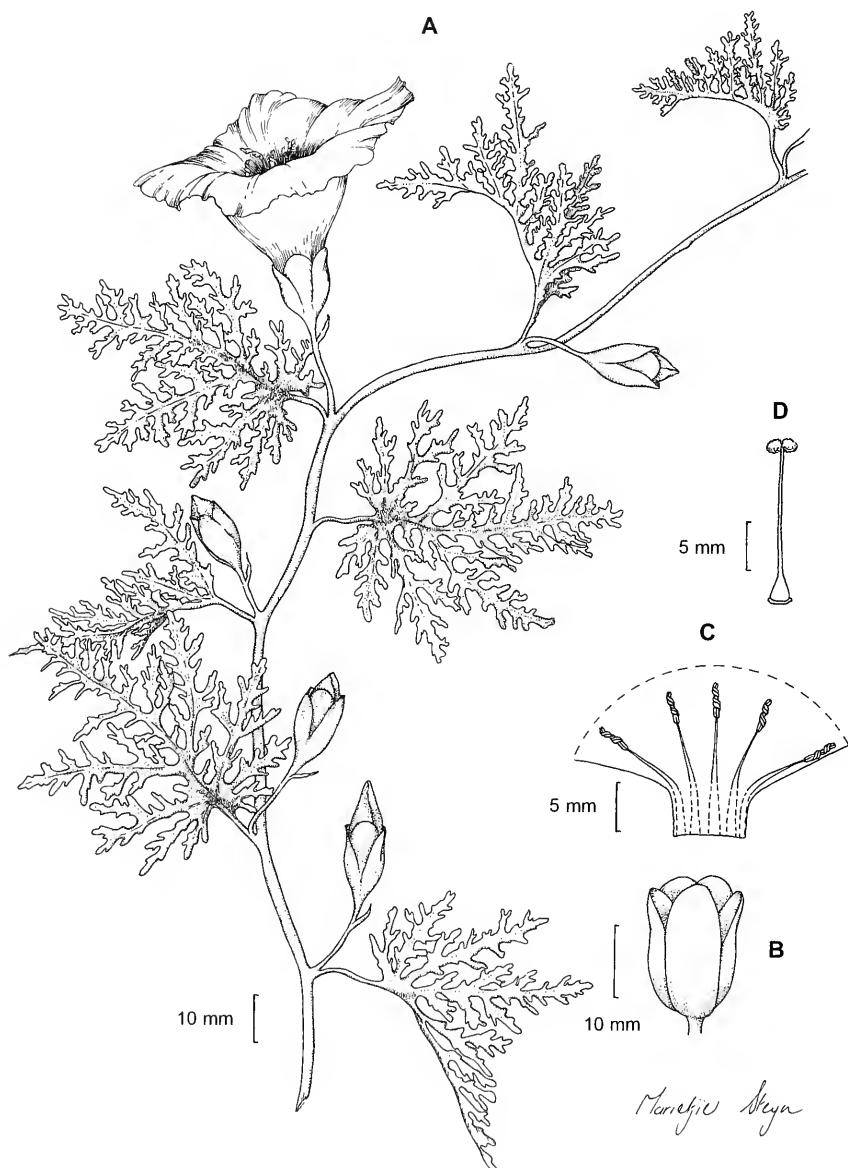


FIGURE 11.—*Merremia bipinnatifida*: A, flowering stem (*Müller* 1321, PRE); B, calyx; C, inside of corolla tube with stamens; D, ovary, style and stigma (*Barnard* 73, PRE). Artist: Marietjie Steyn.

7a Corolla 30–40 mm wide; plant subsucculent, with 30–40 mm broad leaves; leaf segments pinnate towards tips 5. *M. multisecta*

7b Corolla 50–80 mm wide; leaves usually 40–120 mm wide; segments dentate to pinnatilobed to base:

8a Stems procumbent; petiole up to 10 mm long; sepals not with distinct membranous edges (Namibia) 1. *M. bipinnatipartita*

8b Stems climbing (plant is a rather tall liana); petiole 20–50 mm long; sepals coriaceous with membranous edges (not in Namibia) 3. *M. kentrocaulos*

1. ***Merremia bipinnatipartita* (Engl.)**
Hallier f. in *Botanische Jahrbücher* 18: 115 (1893a); Baker & Rendle: 104 (1905–06); A. Meeuse: 705 (1957a); Roessler: 20 (1967a).
 Type: Namibia, Usakos, *Marloth* 1289 (B, holo.†; PRE!, SAM!).

Ipomoea bipinnatipartita Engl.: 246 (1888).

Glabrous perennial herb with a tuberous rootstock. Stems procumbent, up to 2 m long, with rather long internodes, sparsely and minutely tuberculate as are petiole and rhachis of leaves. Leaves orbicular to broadly ovate in outline, 30–70 mm long and wide, bipinnatisect with 2 pairs of lateral leaflets and a terminal one; secondary lobes oblong or linear, usually obtuse but terminal one very acute, almost entire or with a few distant teeth to nearly pinnatisect; petiole up to 10 mm long. Peduncles ± as long as petioles, bearing slightly above middle ovate, 3–4 mm long bracteoles. Sepals obovate, subpuberulous, ± 12 × 16 mm, subcoria-

ceous. Corolla funnel-shaped, with obtuse shallow lobes, ± 50 mm long, 60–80 mm wide, glabrous, white or cream-coloured with purple, deep red or black centre; midpetaline zones with thicker nerves but not well defined. Capsule ellipsoid or obovoid, ± 9 × 6 mm, glabrous, enclosed by calyx, 1-seeded. Seed ellipsoid, truncate at one end, 7 × 5 mm, glabrous. Flowering time February to May. Figure 11.

Merremia bipinnatipartita is more or less confined to the central districts of Namibia where it is locally abundant on red or yellow sandy or gravelly soils. Map 31.

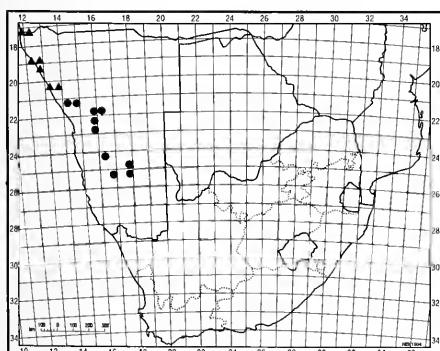
Distinguished by its glabrous parts, single large flowers and bipinnatisect leaves.

Vouchers: *Dinter* 2009 (PRE, SAM); *Giess* 13542 (M, PRE, WIND).

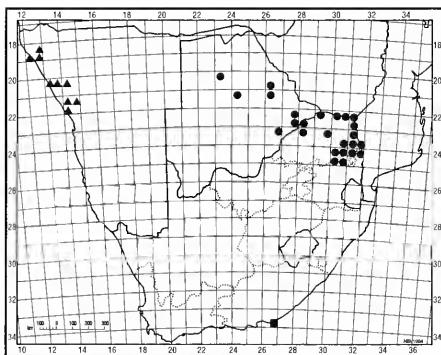
2. ***Merremia guerichii* A. Meeuse** in *Bothalia* 7: 415 (1960); Roessler: 20 (1967a).
 Type: Namibia, Kaokoveld, between Orupembe Waterhole and Kunene River, *De Winter & Leistner* 5741 (PRE, holo.!!; EA!, K!, M!, SRGH!).

M. guerichiana Engl. ex Hallier f.: 115 (1893a), nom. nud.

Perennial suffrutex. Stems several from a woody rootstock, rather firm to wiry, young stems often erect, older ones often prostrate, up to 1.5 m long; young parts rather densely setose-pilose with patent bulbous-based stiff hairs; older parts glabrescent and becoming scabrid, usually ± woody; internodes usually 20–50 mm long. Leaves firmly herbaceous drying parchmentaceous, ovate-orbicular in outline, deeply 3–5-palmatifid, usually nearly glabrous with only a



MAP 31.—● *Merremia bipinnatipartita*
 ▲ *M. multisecta*



MAP 32.—▲ *Merremia guerichii*
● *M. kentrocaulos*
■ *M. malvaefolia*

few setose hairs on midrib and main veins towards base, 10–50 mm long and broad; lobes lyrate to pinnatifid or coarsely and acutely dentate; petiole setose, 5–30 mm long. *Flowers* solitary or in 2-flowered cymes; peduncles rather slender but firm, nearly terete, sparsely setose, 5–40 mm long; bracteoles minute; pedicel 5–60 mm long. *Calyx* green, basal portion rather densely setose or even bristly with stiff bulbous-based patent hairs; sepals subequal, erect, oblong, narrowly elliptic or cuneate-oblong, acute or subobtuse and usually minutely apiculate, 12–18 mm long; in fruit turning brown, slightly enlarged and glabrescent, becoming somewhat scabrid in lower portion. *Corolla* funnel-shaped, white or pale yellow with purple to maroon centre, glabrous, 25–35 mm long and wide, with 5-lobed spreading limb; lobes obtuse, occasionally minutely apiculate. *Stamens* subequal, with papillose, short, stiff straight hairs at laterally broadened base. *Ovary* subglobose, glabrous. *Capsule* subglobose, apiculate, straw-coloured, glabrous, 12 mm in diameter. *Seeds* dark grey or brownish grey, puberulous, \pm 8 mm long. *Flowering time* November to July, mostly in April.

Merremia guerichii seems to be endemic to a small area of the Kaokoveld and Outjo and Omaruru areas in Namibia, where it grows on

sandy, gravelly or stony flats, slopes and in riverbeds. Map 32.

Distinguished by the stiff, pilose-setose, patent hairs on the vegetative parts and calyx and by the deeply 3–5-pinnatifid leaves.

Vouchers: Giess 9716 (M, PRE, WIND); Oliver, Müller & Steenkamp 6672 (PRE, WIND).

3. *Merremia kentrocaulos* (C.B.Clarke)
Rendle in Flora of tropical Africa 4.2: 103 (1905–06); Hallier f.: 21 (1910); Hutch. & Dalziel: 212 (1931); A.Meeuse: t. 1194 (1955a); A.Meeuse: 704 (1957a); Letty: 272, t. 135 (1962); Verdo: 59 (1963a); Heine: 342 (1963); Gonç.: 40 (1987); Gonç.: 42 (1992); A.Fabian & Germish: 336, t. 160c (1997); Retief & P.J.Herman: 387 (1997). Type: Ethiopia, Takkaze River, Schimper 800 (G, K, iso.).

Ipomoea kentrocaulos C.B.Clarke: 213 (1883); N.E.Br: 124 (1909). *Operculina kentrocaulos* (C.B.Clarke) Hallier f.: 119 (1893a); Hiern: 730 (1898).

Large, glabrous, twining perennial. *Stems* becoming woody and up to 15 m long, younger ones slender, herbaceous but firm, terete, usually distinctly muriculate with reddish papillae (as are petioles, peduncles and pedicels). *Leaves* pentagonal in outline, 40–150 mm long and wide, palmately dissected nearly to base; base cordate with a narrow sinus; lobes 5–7, oblong to lanceolate in outline, obtuse to subacute, entire to irregularly and jaggedly pinnatifolobed or pinnatifid; petiole 20–60 mm long. *Inflorescence* cymose, 1- to few-flowered. *Peduncles* patent to suberect, 30–90 mm long; bracteoles ovate, acute, concave, 3–5 mm long, early deciduous, occasionally larger and dissected like leaves; pedicels up to 30 mm long, at first deflexed, patent to suberect when flowers open and ultimately cernuous in fruit. *Sepals* ovate-oblong or elliptic, coriaceous with thinner submembranous edges, glabrous, concave, somewhat unequal, obtuse or rounded and minutely mucronate, up to 30 mm long (inner ones longer than outer ones) and \pm 12 mm wide. *Corolla* funnel-shaped, white to dull pale yellow or buff with dark purple centre, glabrous, 40–60 mm

long, 60–80 mm wide; limb faintly 5-angled, plicate: midpetaline areas not sharply defined. *Capsule* narrowly ellipsoid, 12–15 mm wide, pale brown, dehiscing by 4 valves and circumscissile at base, at first enclosed in accrescent, brown calyx, but ultimately exposed just before dehiscence when sepals spread out. *Seeds* brown to black, minutely hairy, 8–9 mm long, ± 6 mm broad. *Flowering time* July to April, mostly in February and March.

Merremia kentrocaulos occurs in Africa south of the Sahara southwards to Botswana and the Northern Province and Mpumalanga. It is also found in India. It grows in bushveld and savanna on sandy or rocky soils from 200–1 300 m altitude. Map 32.

Distinguished by being a liana with palmately dissected leaves with pinnatifolied or pinnatifid lobes. Some authors uphold two varieties in this variable species: the typical variety with entire or minutely crenulate leaf lobes and var. *pinnatifida* N.E.Br. (1909: 124) with deeply pinnatifid leaf lobes. The southern African specimens can be regarded as belonging to var. *pinnatifida*.

Recorded by Watt & Breyer-Brandwijk (1962: 310) as a medicinal plant.

Vouchers: *Hansen* 3074 (K, PRE, SRGH); *Van Rooyen* 3291 (PRE, PRU).

4. *Merremia malvaefolia* Rendle in Journal of Botany, British and Foreign, London 39: 63 (1901); A.Meeuse: 706 (1957a). Type: Eastern Cape, Kowie, *MacOwan* 403 (K, holo.; BOL!, GRA!).

Ipomoea malvaefolia (Rendle) Baker: 65 (1904). Type as above.

Annual? *Stems* very slender, trailing, shortly pubescent. *Leaves* almost triangular in outline, up to 30 mm wide, palmately 5-lobed beyond middle, brownish tomentose beneath; lobes ± obovate, contiguous, obtuse, apiculate; petiole much shorter than blade. *Peduncles* slender, ascending, 40–100 mm long, 1-flowered; brac-

teoles small, linear, remote from calyx. *Calyx* 8–13 mm long, shortly pubescent; sepals chartaceous, oblong, obtuse, much imbricate, outer hispid. *Corolla* widely funnel-shaped, pale yellow, 30–50 mm long, silky on midpetaline areas. *Pollen* ellipsoid, granular, with 3 longitudinal smooth areas. *Capsule* unknown. *Seed* unknown. *Flowering time* unknown.

This very rare, perhaps even extinct species is confined to the Bathurst and, according to the literature, also the Albany and Somerset East districts of the Eastern Cape. Map 32.

Distinguished by the brownish tomentose underside of the palmately 5-lobed leaves.

Voucher: *MacOwan* 403 (BOL, GRA, K).

5. *Merremia multisecta* Hallier f. in Botanische Jahrbücher 18: 115 (1893a); Hiern: 728 (1898); Baker & Rendle: 109 (1905–06); Roessler: 20 (1967a). Type: Angola, Mossamedes, Welwitsch 6112 (B, holo.†; G-DC, syn.).

Perennial herb, somewhat succulent, rich in latex, ± stiff and stocky, totally glabrous. *Stems* several from base, prostrate, terete, purplish, up to 1.5 m long. *Leaves* reniform in outline, up to 35 mm long, up to 60 mm broad, 5-fid nearly to base, segments pinnately dissected throughout, partly coarsely serrate, revolute, drying dark; petiole ± 20 mm long. *Peduncles* 30–60 mm long, 1–3-flowered; bracteoles lanceolate, minute. *Sepals* elliptic-lanceolate, acute, subequal, subcoriaceous, up to 15 × 6 mm, margins sometimes sparsely ciliate. *Corolla* white or pale yellow, occasionally with dark red centre, shortly funnel-shaped, up to 25 mm long, 30–40 mm wide. *Capsule* globose, 8 mm wide, 2-locular. *Seeds* 2–4, globose or planoconvex, grey. *Flowering time* November to July, mostly in April.

This species occurs in the Kaokoveld and Outjo areas of Namibia as well as in Angola. It usually grows on sandy or gravelly soils along or in dry watercourses, sometimes forming hummocks. Map 31.

Distinguished by being subsucculent and leaf segments being pinnately dissected throughout.

Vouchers: *Giess* 8003 (M, PRE, WIND); *Merxmüller* & *Giess* 30664 (M, PRE, WIND).

6. *Merremia palmata* *Hallier* f. in *Botanische Jahrbücher* 18: 112 (1893a); *Baker* & *Rendle*: 108 (1905–06); *A.Meeuse*: 704 (1957a); *A.Meeuse*: t. 1245 (1957b); *Verdc.*: 58 (1963a); *Roessler*: 20 (1967a); *Compton*: 475 (1976); *Gonç.*: 41 (1987); *A.E.van Wyk* & *S.Malan*: 126 (1988); *Gonç.*: 44 (1992); *A.Fabian* & *Germish.*: 336, t. 160b (1997); *Retief* & *P.P.J.Herman*: 387 (1997). Type: Namibia, Ameib, *Belck* 52 (BRA, lecto.; JE).

Glabrous, prostrate or occasionally twining, perennial herb. *Stems* herbaceous, up to 2.5 m long, sulcate and/or ribbed to almost winged. *Leaves* deeply palmately 5–9-lobed (lowest lobes sometimes unequally forked); lobes narrowly linear to oblanceolate, acute or obtuse, mucronate, 1–16 mm × 5–60 mm; petiole 12–25 mm long, slender. *Inflorescence* solitary or occasionally cymosely 2- or 3-flowered; peduncle 10–65 mm long, slender; bracteoles small, linear; pedicels 5–30 mm long, somewhat thicker upwards. *Sepals* subequal, pale yellowish green, elliptic with rounded apex, glabrous, coriaceous with a membranous edge, 7–10 mm long. *Corolla* pale or sulphur-yellow with deep red,

maroon or deep magenta centre, 20–30 mm long, broadly funnel-shaped with spreading 30–40 mm wide, faintly lobed limb; midpetaline areas sparsely pubescent towards apex. *Style* linear with membranous winged edges. *Capsule* usually distinctly exserted from calyx, globose- or ovoid-conical, 8–12 mm long and 8–10 mm wide, glabrous, pale yellowish green turning straw-coloured, valves papyraceous. *Seeds* dark greyish brown to black, rather dull, glabrous, nearly smooth to distinctly rugose, flattish, 6–7 mm long, ± 5 mm wide and ± 3 mm thick. *Flowering time* November to April.

Merremia palmata is fairly common and widespread from tropical East Africa to Angola and southern Africa where it is found in Namibia, Botswana, Swaziland and the northern parts of South Africa. It is also found in India. It prefers open, dry, deciduous bushveld or woodland and also wooded grassland, up to 1 370 m. Map 33.

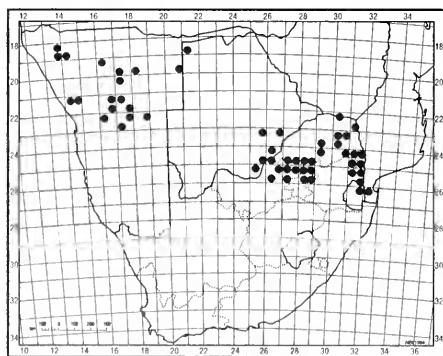
Distinguished by its deeply palmately 5–9-lobed leaves and glabrous concolorous sepals.

Vouchers: *Culverwell* 1135 (PRE); *Giess* 10879 (M, PRE, WIND); *Hansen* 3125 (K, PRE, SRGH); *Onderstall* 127 (PRE).

7. *Merremia pinnata* (*Hochst. ex Choisy*) *Hallier* f. in *Botanische Jahrbücher* 16: 552 (1893b); *Hallier* f.: 116 (1893a); *Dammer*: 330 (1895); *Baker* & *Rendle*: 113 (1905–06); *A.Meeuse*: 707 (1957a); *Verdc.*: 55 (1963a); *Heine*: 341 (1963); *Roessler*: 20 (1967a); *Gonç.*: 37 (1987); *Gonç.*: 39 (1992); *Lejoly* & *Lisowski*: 28 (1992); *Retief* & *P.P.J.Herman*: 387 (1997). Type: Sudan, Kordofan, *Kotschy* 262 (G, holo.; WAG).

Ipomoea pinnata *Hochst. ex Choisy*: 353 (1845); *N.E.Br.*: 124 (1909).

Annual trailing or twining herb. *Stems* slender, up to ± 750 mm long, pubescent with soft, mostly distinctly bulbous-based spreading hairs (at least when young), as are leaves, peduncles, bracts, calyx and capsule. *Leaves* sessile, 10–45 mm × 5–20 mm, deeply pinnatifid; lobes in



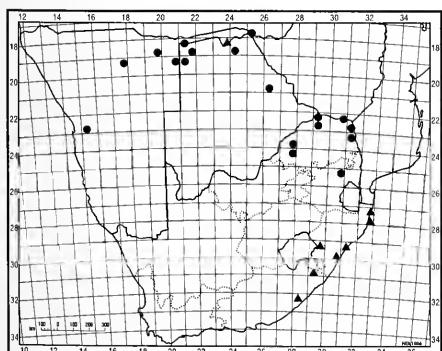
MAP 33.—*Merremia palmata*

8–12 pairs, linear, entire, extending almost to midrib, the lowest branched and stipule-like. *Inflorescence* 1- to few-flowered; peduncle up to 40 mm; bracteoles subulate to linear-subulate, 2–8 mm long; pedicels usually up to 5 mm long. *Sepals* unequal, elliptic, 4–8 mm long, markedly acuminate at apex, subcoriaceous, pilose with long hairs; inner sepals much smaller than outer. *Corolla* glabrous, white, greenish white, cream-coloured or yellow, narrowly funnel-shaped, 7–8 mm long, 5-lobed; lobes broadly ovate, obtuse; midpetaline areas not differentiated. *Ovary* with stiff hairs longer than itself. *Capsule* globose or ovoid, straw-coloured, \pm 6 mm long, 5–6 mm wide. *Seeds* dark brown to black, glabrous, \pm 2 mm long, 1.0–1.5 mm wide, with grey, minutely raised markings. *Flowering time* September to May, mostly March and April.

Widespread throughout tropical Africa southwards to Namibia, Botswana and the Northern Province and Mpumalanga. It is found in woodland, savanna, grassland, riverine forest and also along roadsides and on cultivated or eroded ground. Map 34.

Distinguished by its sessile, pinnatifid leaves and 7–8 mm long flowers.

Vouchers: *Barnard* 678 (PRE); *Glen* 2614 (PRE); *Müller & Giess* 553 (PRE, WIND).



MAP 34.—● *Merremia pinnata*
▲ *M. pterygocaulos*

8. ***Merremia pterygocaulos* (Choisy)**
Hallier f. in *Botanische Jahrbücher* 16: 552 (1893b); *Hallier* f.: 113 (1893a); *Dammer*: 330 (1895); *Hiern*: 727 (1898); *Baker & Rendle*: 105 (1905–06); *Hutch. & Dalziel*: 212 (1931); *A.Meeuse*: 702 (1957a); *Verdc.*: 57 (1963a); *Heine*: 342 (1963); *Compton*: 476 (1976); *Gonç.*: 42 (1987); *Gonç.*: 45 (1992); *Lejoly & Lisowski*: 33 (1992). Type: *Ethiopia*, Tigré, *Schimper* 630 (G, holo.; BM, K).

Ipomoea pterygocaulos Choisy: 381 (1845).

I. tetraptera Baker: 65 (1904). *M. tetraptera* (Baker) *Hallier* f.: 21 (1910). Type: *KwaZulu-Natal*, Durban, *J.M. Wood* 7542 (NH, syn.).

Perennial, \pm shrubby climber, glabrous except for corolla. *Main stems* with 4 narrow membranous wings, ultimate branches slender, 4-angled. *Leaves* cordate-ovate to suborbicular in outline, 30–150 mm long and wide, palmately 3–9-lobed to \pm the middle; lobes usually ovate, acute or cuspidate and mucronate, entire or subrepand; petiole \pm 4-angled, up to 85 mm long. *Inflorescence* cymosely few-flowered, rarely solitary; peduncle \pm 4-angled, up to 150 mm long; bracteoles minute, linear; pedicels up to 30 mm long, often scarred, thickened, angled, subclavate, remaining erect in fruit. *Calyx* 9–11 mm long; sepals ovate-oblong or oblong, obtuse, much imbricate, chartaceous, pale yellowish green, accrescent and becoming broadly ovate to orbicular, ultimately spreading in fruit. *Corolla* broadly funnel-shaped, pale yellow, cream-coloured or white with red or purple throat, 25–35 mm long, 35–45 mm wide; midpetaline areas strigosely pilose outside. *Capsule* ovoid-conical, almost truncate or flattened-depressed at apex and crowned with persistent style base, brown, glabrous, 12–15 mm long and \pm as wide at base. *Seeds* subglobose, 5–7 mm long, smooth, black, glabrous. *Flowering time* November to April.

Widespread throughout Africa south of the Sahara and also in Madagascar. In southern Africa it is uncommon in northern Botswana, Swaziland, KwaZulu-Natal and the Eastern Cape. It grows in forest, bushveld and grassland, often on sandy alluvial soil. Map 34.

Distinguished by its winged stems and shrubby, climbing habit.

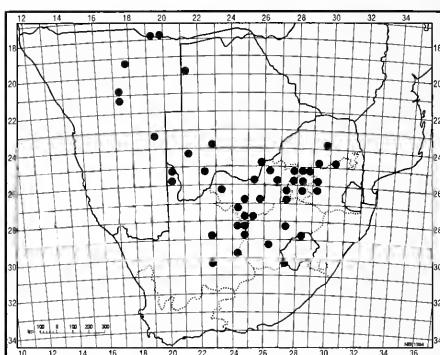
Vouchers: *Edwards* 3037 (PRE); *Smith* 3569a (PRE, SRGH); *Strey* 10702 (NH, PRE).

9. ***Merremia verecunda* Rendle** in Flora of tropical Africa 4.2: 110 (1905–06); Pilg.: 349 (1912); A.Meeuse: t. 1193 (1955b); A.Meeuse: 703 (1957a); Letty: 272, t. 136 (1962); Roessler: 21 (1967a); J.Adams: t. 121 (1976); Gonç.: 40 (1987); Retief & P.P.J.Herman: 387 (1997). Type: Botswana, Ngamiland, Kgwebe Hills, *Lugard* 134 (BM, lecto., K, GRA!).

Ipomoea verecunda (Rendle) N.E.Br.: 123 (1909). Type as above.

I. quinquefolia Hochst. ex Hallier f. var. *pubescens* Baker: 66 (1904). Type: Northern Cape, Hopetown, *Muskett* 2051, 9285 (BOL, syn.).

Herbaceous annual. Stems usually several from base, procumbent, trailing, rather slender, \pm 1.5 m long, \pm angular, glabrous or thinly hairy. Leaves deeply palmately to pedately 7–11-sect, 20–80 mm wide, glabrous above, thinly pubescent beneath; leaflets linear-oblong, narrowly oblong-lanceolate or spatulate-obovate, acute or obtuse, apiculate, contracted at base, lateral ones gradually smaller; petiole 20–60 mm long. Inflorescence 1-flowered or rarely cymosely 2- or 3-flowered; peduncle up to 50 mm long; bracteoles linear or linear-lanceolate, acute, thinly pubescent, 5–8 mm long; pedicels 5–30 mm, at first erect or patent, ultimately reflexed. Calyx turbinate, 10–15 mm long in flower, inflated in fruit; sepals unequal, ovate, subobtuse to acuminate, \pm 8 mm long, concave, softly pubescent, pale green, with 6 or 7 longitudinal, purple-brown nerves, deeply sulcate-plicate and with small purplish spots, hairy on nerves, very accrescent in fruit; inner ones shorter and narrower, less concave, without or with only a few purplish stripes, not sulcate or plicate, hardly accrescent in fruit. Corolla widely funnel-shaped, 15–20 mm long, 20–30 mm wide, yellow or whitish with purplish centre; limb shallowly 5-lobed to pentagonal; midpetaline areas not distinct, glabrous



MAP 35.—*Merremia verecunda*

or thinly pubescent towards base. Capsule completely enclosed by inflated calyx, 4-lobed and somewhat depressed, 8–12 mm wide, pericarp very thin, membranous, scarious, white, subhyaline, irregularly dehiscent to 4-valved. Seeds 1–4, black, shiny, smooth, glabrous except for minute flattened hairs along ciliate angles and shortly pubescent hilum; 5–6 mm long. Flowering time December to April.

Fairly common in the central and northern parts of Namibia, Botswana, South Africa and in Lesotho; also in Zimbabwe. Map 35.

Distinguished by its deeply palmately 7–11-lobed leaves and turbinate calyx with prominent longitudinal nerves.

Vouchers: *Acocks* 14291 (PRE); *Codd* 8444 (PRE); *De Winter & Marais* 4964 (PRE); *Die terlen* 786 (PRE); *Vahrmeijer & Steenkamp* 3032A (PRE); *Zietsman* 703 (PRE).

Excluded species

Merremia dissecta (Jacq.) Hallier f. Ross (1972: 295) cites *Schweickerdti* 1361 (NH). This specimen, however, was collected in the Durban Botanical Garden. *M. dissecta* is a perennial twiner, native to the southern United States of America and southwards to Argentina. In tropical regions it occasionally escapes from cultivation. See Bailey & Bailey (1977: 729) and Welman (1997: 141).

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12. *XENOSTEGIA*

Xenostegia D.F.Austin & Staples in Brittonia 32: 533 (1980); Lejoly & Lisowski: 379 (1993b). Type species: *X. tridentata* (L.) D.F.Austin & Staples.

Merremia Dennst. auct. pro min. parte.

Prostrate or climbing herbs. *Leaves* shortly petiolate, mostly glabrous, linear to lanceolate-elliptic or spatulate, truncate or hastate-sagittate at base; basal lobes of blade dentate or entire; apex acute or obtuse to truncate or emarginate, mucronate or tridentate. *Inflorescence* cymose, 1–3-flowered. *Calyx* subequal or two outer sepals larger, oblong to oblong-ovate, acute to subobtuse, occasionally sagittate at base; inner sepals usually lanceolate or lanceolate-acuminate. *Corolla* broadly funnel-shaped to campanulate; in accepted species 10–23 mm long, pale yellow to sometimes white, often with dark purple to brown centre. *Anthers* straight at anthesis; pollen grains pantoporate, smooth. *Capsule* ovoid, 4-valved, glabrous or pubescent towards apex. *Seeds* 1–4, 2–3 mm long, ovoid-trigonous, brown or black, obtuse at apex.

Two recognised species, one represented by a subspecies in southern Africa.

The segregation of *Xenostegia* from *Merremia* is based on two characters, namely the straight anthers at anthesis (in contrast to the always at least somewhat twisted anthers typical of *Merremia*) and the pantoporate pollen grains, rather unique in the family.

***Xenostegia tridentata* (L.) D.F.Austin & Staples** in Brittonia 32: 533 (1980); Lejoly & Lisowski: 379 (1993b). Iconotype: Rheedea, Horti malabarici pars undecima ... 11: 133, t. 65 (1692).

Convolvulus tridentatus L.: 157 (1753).

Merremia tridentata (L.) Hallier f.: 552 (1893b); Hallier f.: 116 (1893a); Baker & Rendle: 111 (1905–06); Brenan: 8 (1954); Heine: 341 (1963); Verdc.: 51 (1963a); Roessler: 20 (1967a); Compton: 476 (1976); Gonç.: 35 (1987); Gonç.: 36 (1992). Type as above.

subsp. ***angustifolia* (Jacq.) Lejoly & Lisowski** in Fragmenta Floristica et Geobotanica 38,2: 379 (1993b). Iconotype: Jacq., Icones planatarum rariorum 2: 10, t. 317 (1786–1793).

Ipomoea angustifolia Jacq.: 367 (1789); Baker & C.H.Wright: 55 (1904); N.E.Br.: 122 (1909). *M. angustifolia* (Jacq.) Hallier f.: 552 (1893b); Hallier f.: 117 (1893a); Baker & Rendle: 111 (1905–06); Hutch. & Dalziel: 211 (1931). *M. tridentata* (L.) Hallier f. subsp. *angustifolia* (Jacq.) Ooststr.: 323 (1939); Ooststr.: 446 (1953); Brenan: 8 (1954); A.Meeuse: 706 (1957a); Verdc.: 51 (1963a); Heine: 341 (1963); Gonç.: 35 (1987); A.E.van Wyk & S.Malan: 126 (1988). *M. tridentata* (L.) Hallier f. subsp. *angustifolia* (Jacq.) Ooststr. var. *angustifolia*; Verdc.: 51 (1963a); Gonç.: 35 (1987); Gonç.: 36 (1992); A.Fabian & Germish.: 334, tt. 159h, 160a (1997); Retief & P.P.J.Herman: 387 (1997).

I. convolvuloides Schinz: 273 (1888). Type: Namibia, Oshikehe, Schinz s.n. (not found in BREM, Z or ZT).

C. longipedunculatus Dinter ex A.Meeuse: 706 (1957a), nom. nud. in syn.

Perennial herb, glabrous or rarely pubescent, prostrate and sometimes also twining. *Stems* slender, subterete to angular, striate-ribbed, up to at least 1 m long. *Leaves* linear to narrowly oblong, ± obtuse, mucronate, 20–80 mm long, usually 2–6 mm wide, with small toothed hastate basal auricles; petiole up to 5 mm long or leaves almost completely sessile. *Peduncles* very slender, 10–60 mm long, 1-, more rarely 2- or 3-flowered; bracteoles minute, lanceolate or cuspidate, persistent; pedicels thickened upwards, 5–20 mm long. *Sepals* cuspidate or mucronate, glabrous, 5–10 mm long; two outer ones slightly shorter than inner ones. *Corolla* pale to bright yellow, often with dark reddish or brownish centre, funnel-shaped, 12–20 mm long; limb shallowly 5-lobed with ± broadly triangular, acute lobes; mid-petaline areas well defined. *Capsule* globose to ovoid, ± 6 mm in diameter, valves papery, straw-coloured. *Seeds* 4 or fewer, yellowish brown to dark greyish brown, 3–4 mm long, glabrous. *Flowering time* November to May. Figure 12.

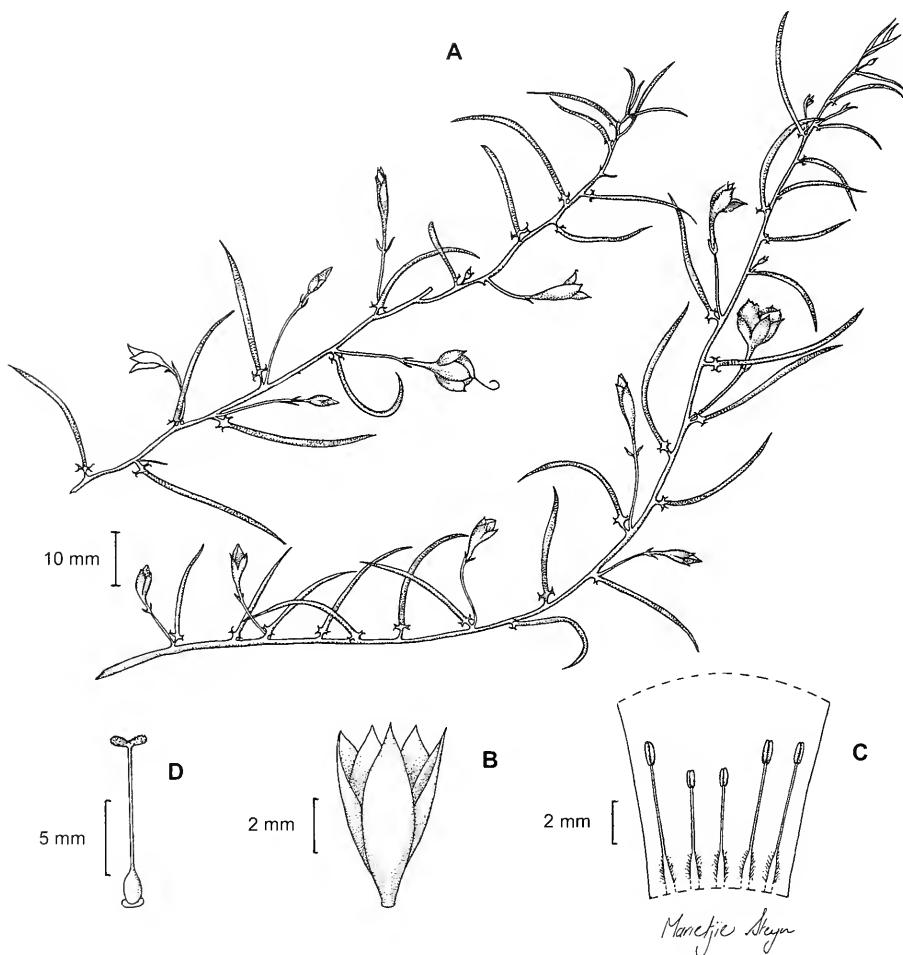
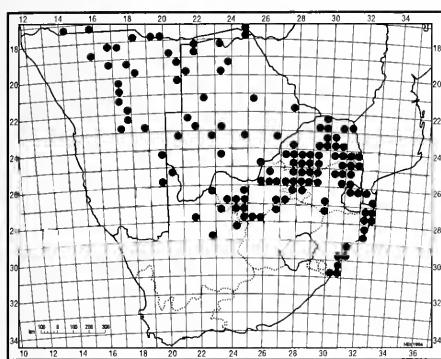


FIGURE 12.—*Xenostegia tridentata* subsp. *angustifolia*: A. flowering stems; B. calyx; C. inside of corolla tube with stamens; D. ovary, style and stigma (Retief 1309, PRE). Artist: Marietjie Steyn.

Common and widespread throughout the northern part of South Africa and also in Namibia, Botswana and Swaziland. It is also common in tropical Africa and Asia, reaching Australia. It grows in a variety of habitats and can occur as a weed. Map 36.

Distinguished by its long, narrow leaves with small basal auricles; vegetative parts dry reddish brown. The combination by Meeuse in Meeuse & Welman (1996: 49) was superfluous (Welman: 253 (1999a). Austin & Staples (1980) did not maintain the infraspecific taxa distinguished by



MAP 36.—*Xenostegia tridentata* subsp. *angustifolia*

various authors. The African material seen, is rather constant in its characters (see also Verdcourt 1963a). Gonçalves (1987: 35) cited specimens from Botswana and the Caprivi

belonging to var. *angustifolia* and var. *pubescens* Rendle. These varieties are based on differences in hairiness and are not maintained here. Specimens that are very similar to subsp. *angustifolia* but have broad sepals with conspicuously crisped margins and five wing-ridges on the pedicel have been distinguished as subsp. *alatipes* (Dammer) Lejoly & Lisowski (1993b: 381). This subspecies has been recorded from areas adjoining South African territory, namely Mozambique and Zimbabwe and may occur in the *Flora* area.

It is suspected of being poisonous (Wells *et al.* 1986: 353). Watt & Breyer-Brandwijk (1962: 310) record it as a medicinal plant.

Vouchers: *Culverwell* 1280 (PRE); *De Winter* & *Marais* 3736 (M, PRE, WIND); *Esterhuyzen* 2233 (BOL, PRE); *Meeuse* 9214 (PRE); *O'Connor* 90 (PRE); *Strey* 9696 (NH, PRE); *Wild* 5000 (PRE, SRGH).

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13. ASTRIPOMOEA

Astripomoea *A.Meeuse* in Bothalia 6: 709 (1957a); Verdc.: 72 (1963a); Roessler: 2 (1967a); R.A.Dyer: 505 (1975); Gonç.: 51 (1987); Gonç.: 54 (1992); Lejoly & Lisowski: 387 (1993b). Type species: *A. lachnosperma* (Choisy) A.Meeuse.

Astrochlaena Hallier f.: 120 (1893a); Baker & C.H.Wright: 68 (1904); Baker & Rendle: 118 (1905–06); E.Phillips: 623 (1951); A.Meeuse: 198 (1955c); non *Astrochlaena* Corda (1845) nec Gärcke (1850) nom. illegit. Type species: *Astrochlaena lachnosperma* (Choisy) Hallier f.

Erect or trailing, annual or perennial herbs or undershrubs, covered with a conspicuous indumentum of soft stellate hairs on all vegetative parts, peduncles, bracteoles, pedicels and sepals. *Stems* usually simple or branched upwards, often firm to stout. *Leaves* petiolate, usually ovate, oblong to subcordate, entire to coarsely dentate-sinuate. *Inflorescence* cymose, few- to many-flowered or by reduction occasionally 1-flowered; cymes axillary but often forming terminal leafy panicles at apex of stems; bracteoles often small; pedicels usually short. *Sepals* 5, usually ± unequal, often ovate or oblong to lanceolate; outer ones often subcarinate dorsally. *Corolla* funnel-shaped, purple or violet or white with a purple centre, limb spreading, almost entire; midpetaline areas well defined. *Stamens* included, unequal in length; filaments filiform or linear; anthers oblong, somewhat lobed or sagittate at base, sometimes covered with swollen hairs; pollen spherical, spinulose. *Disc* annular. *Ovary* bilocular, 4-ovuled; style simple, included; stigmas thick, bicapitate or oblong. *Capsule* dehiscent, 4-valved, usually glabrous. *Seeds* 4, usually covered with a velvety or cobwebby to villous tomentum.

A genus of about 12 ill-defined and variable species confined to Africa; closely related to *Ipomoea* but with a distinctive stellate indumentum and facies. Three species occur in southern Africa.

- 1a Corolla up to 20 mm long, tube purple, limb white 1. *A. lachnosperma*
- 1b Corolla 25–50 mm long, concolorous (purple, mauve or magenta):
 - 2a Corolla 25–40 mm long; leaves usually ovate, cuneate to rounded at base; seeds very minutely velvety pulverent 2. *A. malvacea*
 - 2b Corolla 45–50 mm long; leaves broadly ovate to rotundate, shallowly and broadly cuneate to rounded at base; seeds distinctly villous 3. *A. rotundata*

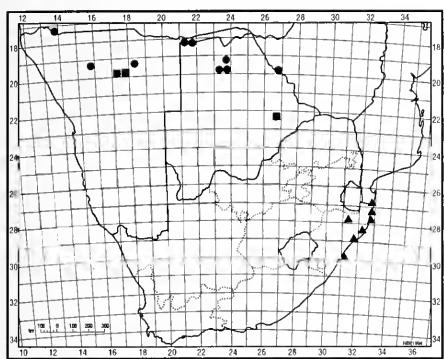
1. *Astripomoea lachnosperma* (Choisy)

A.Meeuse in Bothalia 6: 710 (1957a); Verdc.: 195 (1958b); Verdc.: 77 (1963a); Heine: 344 (1963); Roessler: 2 (1967a); Gonç.: 54 (1987); Gonç.: 57 (1992); Lejoly & Lisowski: 390 (1993b). Type: Kordofan, Sudan, Kotschy 260 (G, holo.; JE, K, L, PRE!).

Ipomoea lachnosperma Choisy: 356 (1845). *Astrochlaena lachnosperma* (Choisy) Hallier f.: 121 (1893a); Baker & Rendle: 119 (1905–06); N.E.Br.: 124 (1909); Hutch. & Dalziel: 213 (1931).

Annual with woody base. *Stems* simple, erect, up to 1.25 m high, covered with pale fawn to whitish stellate tomentum (as are petioles,

peduncles, pedicels and calyx), firm, glabrescent at base. *Leaves* ovate, varying to broadly elliptic, ovate-lanceolate or subrhomboid, entire to slightly or occasionally distinctly repand in upper half, 30–150 mm × 20–120 mm, rounded or truncate to broadly cuneate at base, usually gradually narrowing into an acute or acuminate to subaristate apex, thinly covered with white stellate hairs above, more densely so and paler beneath; petiole 10–50 mm long. *Flowers* in crowded, ± 6-flowered cymes; peduncle up to 55 mm long; pedicel ± 5 mm long. *Sepals* lanceolate to ovate-lanceolate, acute, 6–8 mm long, tomentose outside. *Corolla* funnel-shaped, ± 18 mm long, cream-coloured to white

MAP 37.—● *Astripomoea lachnasperma*▲ *A. malvacea*■ *A. rotundata*

with purple centre; limb \pm 20 mm wide. Capsule ovoid, glabrous, 6–10 mm long. Seeds villous-silky. Flowering time February to May.

Widespread from Eritrea to Nigeria, and from East Africa to Botswana and Namibia. Grows in *Colophospermum* and *Acacia-Commiphora* woodland, in grassland and along roadsides on red or sandy soils and in dry, rocky places, from 350–2 600 m. Map 37.

Distinguished by its smallish flowers in crowded cymes.

Vouchers: Merxmüller & Giess 30426 (M, PRE, WIND); Ngoni 489 (PRE, SRGH).

2. *Astripomoea malvacea* (Klotzsch) A. Meeuse in Bothalia 6: 710 (1957a); Verdc.: 192 (1958b); Verdc.: 74 (1963a); Heine: 344 (1963); Gonç.: 51, t. 16 (1987); Gonç.: 54, t. 15 (1992); Lejoly & Lisowski: 387, fig. 10 (1993b). Type: Inhambane and Sena, Mozambique, Peters s.n. (B, syn.†); t. 367 in Peters, *Naturwissenschaftliche Reise nach Mossambique*: 245 (1861) (icono.).

Breweria malvacea Klotzsch: 245 (1861); *Astrochlaena malvacea* (Klotzsch) Hallier f.: 121 (1893a); Baker & C.H.Wright: 69 (1904); Baker & Rendle: 121 (1905–6); Hutch. & Dalziel: 213 (1931); Brenan: 8 (1954).

Perennial subshrub. Stems up to 2 m long, erect, ascending or decumbent, firm, \pm densely clothed with short whitish to fawn pubescence, glabrescent and becoming woody at base. Leaves usually ovate, sometimes varying to broadly ovate, ovate-lanceolate or subrhomboid, 30–120 mm \times 20–80 mm, entire or repand, rounded, truncate or sometimes somewhat cuneate at base, acuminate to rounded at apex, dull green drying brownish and sparsely stellate-hairy to glabrescent above, matted with white stellate tomentum beneath; petiole usually much shorter than leaf blade, densely stellate-hairy as are peduncles, pedicels and calyx. Inflorescence axillary and terminal, often forming leafy panicles at top of stems; peduncle rather slender, lower ones up to 120 mm long, upper ones much shorter, erect to patent, subumbellately 1- to few-flowered; bracteoles minute, early deciduous; pedicels 5–20 mm long, distinctly sub-clavate. Sepals elliptic to ovate, acute to obtuse, 6–10 mm long. Corolla funnel-shaped, mauve or purple, glabrous or nearly so, 25–40 mm long, limb up to 50 mm wide. Capsule subglobose, glabrous, 6–12 mm \times 6–9 mm. Seed ovoid, compressed, blackish brown, minutely velvety-pulverulent with a tuft of fawn hairs around hilum. Flowering throughout the year, mostly from July to December. Figure 13.

Widespread from western tropical Africa to eastern Africa and southwards to KwaZulu-Natal where it occurs in the coastal zone as far south as Durban. It grows in open *Brachystegia* woodland, savanna, bushland, grassland, along riversides, on cultivated ground such as plantations, also along roadsides and in clearings, on sandy soil and in swamps, from 60–2 240 m. Map 37.

Verdcourt (1958b) divided this species into a number of ill-defined varieties, all of which are connected by intermediates. The specimens from KwaZulu-Natal can be regarded as part of the typical variety. Distinguished by its 25–40 mm long flowers and ovate leaf shape.

Recorded by Watt & Breyer-Brandwijk (1962: 306) as a medicinal plant.

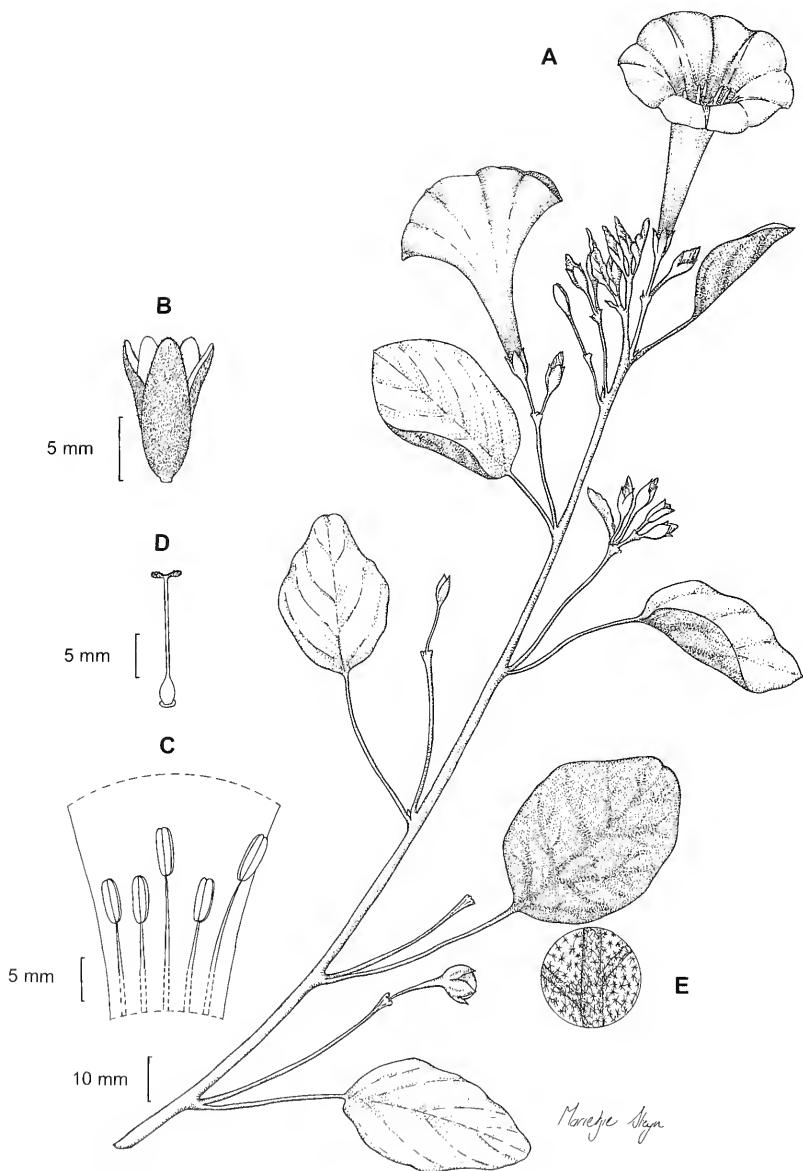


FIGURE 13.—*Astripomoea malvacea*: A, flowering stem; B, calyx; C, inside of corolla tube with stamens; D, ovary, style and stigmas; E, detail of lower leaf surface (*Nicholas 1622, PRE*). Artist: Marietjie Steyn.

Vouchers: *MacDevette* 304 (NH, PRE); *J.M. Wood* 5172 (NH, PRE).

3. ***Astripomoea rotundata* (Pilg.) A.Meeuse** in Bothalia 6: 711 (1957a); Roessler: 3 (1967a). Type: Namibia, Aukas Kreyfontein, Dinter 817 (B, syn.†; SAM, iso.!). Namibia, Otavipforte, Dinter 817A (B, syn.†).

Astrochlaena rotundata Pilg.: 222 (1910); Dinter: 345 (1918).

Perennial. Stems prostrate, up to at least 1.2 m long, firm and stout, densely covered with short stellate brown tomentum, as are petioles, main veins on lower leaf surface, peduncles, pedicels and calyx. Leaves broadly ovate-subcordate to almost orbicular-subcordate, 40–80 mm × 30–70 mm, entire or somewhat repand, rounded, truncate, subcordate to subcuneate at base, acute to subacute at apex and often with a short mucro, rather thinly stellate-hairy above, more densely so between prominent veins and distinctly paler below; petiole 10–50 mm long. Peduncles main-

ly axillary, 40–70 mm long, 1–3-flowered; bracteoles small, early deciduous; pedicels subumbellate, 10–25 mm long. Sepals ovate-lanceolate or elliptic, obtuse, sometimes mucronate, 10–12 mm long; inner ones narrower and more acute. Corolla funnel-shaped, purple, 45–50 mm long; limb as much wide. Capsule subglobose to ovoid, glabrous, 10–12 mm long, ± 10 mm wide. Seeds densely and shortly villous. Flowering time December to March.

This taxon is rare in northern Namibia and Botswana. Recorded from grassland. Map 37.

Astripomoea rotundata differs from *A. malvacea* var. *volkensii* (Dammer) Verdc. (from tropical Africa) in its leaf shape and size and particularly in its villous seeds. It is advisable to keep this species separate at this stage. Distinguished by its 45–50 mm long flowers and rounded leaves.

Vouchers: *Barnard* 625 (PRE); *Merxmüller* 2172 (M, PRE, WIND).

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14. IPOMOEAE

Ipomoea L., Species plantarum, 1st edn: 159 (1753); L.: 76 (1754); Choisy: 348 (1845); Benth. & Hook.f.: 870 (1876); Peter: 28 (1891); Hallier f.: 583 (1893b); Hallier f.: 123 (1893a); Baker & C.H.Wright: 46 (1904); Baker & Rendle: 128 (1905–06); Ooststr.: 481 (1940); E.Phillips: 624 (1951); Ooststr.: 461 (1953); A.Meeuse: 711 (1957a); Verdc.: 81 (1963a); Roessler: 6 (1967a); R.A.Dyer: 505 (1975); Gonç.: 55 (1987); Gonç.: 58 (1992). Type species: *I. pes-tigridis* L.

Pharbitis Choisy: 441 (1834); Choisy: 345 (1845); Peter: 31 (1891).

Calonyction Choisy: 441 (1834); Choisy: 345 (1845); Peter: 26 (1891); Hallier f.: 583 (1893b); Hallier f.: 153 (1893a).

Rivea Choisy: 325 (1845); Hallier f.: 155 (1893a).

Turbina sensu A.Meeuse: 773 (1957a); non Raf.: 81 (1838).

Annuals, biennials or perennials, herbaceous, suffruticose or sometimes woody. *Stems* usually twining or prostrate, rarely floating or erect. *Leaves* varying in shape and size, entire, lobed or deeply divided, simple or rarely compound, often cordate at base, petiolate or rarely sessile, pseudostipules sometimes present. *Inflorescence* axillary, cymose, but sometimes dense and pseudocapitate, few- to many-flowered but not infrequently 1-flowered by reduction; cymes rarely forming a terminal leafy panicle; peduncle short or long, rarely almost absent; bracteoles various, usually small, linear or lanceolate, sometimes leafy, free or forming an involucle; pedicels usually distinct, sometimes long, occasionally very short. *Sepals* 5, very variable in size and shape, often unequal, herbaceous, membranaceous to coriaceous, glabrous or hairy, persistent, often ± enlarged in fruit. *Corolla* small to large, variously coloured, usually regular, rarely faintly zygomorphic, usually funnel-shaped or tube somewhat campanulate, sometimes hypocrateriform; limb shallowly, occasionally deeply 5-lobed; midpetaline areas well defined by 2 distinct nerves, often hairy towards their tips. *Stamens* 5, usually unequal, inserted near base of corolla tube, subincluded or sometimes exserted; filaments filiform or somewhat linear, often dilated and hairy or papillate at base; anthers ovate to linear; pollen globose, spinose or spinulose. *Disc* annular. *Ovary* 2–4-locular, or rarely 5-locular, usually 4-ovuled, rarely with 6–10 ovules; style filiform, included to exserted; stigma capitate, entire or often 2- or 3-globular. *Capsule* globose to ovoid or ellipsoid, dehiscent by 3–10 valves, also indehiscent (*Turbina*). *Seeds* usually 4 (rarely fewer by abortion or up to 10), glabrous or hairy.

A very large cosmopolitan genus of about 500 species, most common in the tropics. The subgenera and sections represented in this account are listed below. See Meeuse (1957a), Verdcourt (1957b, 1963a) and Austin & Huáman (1996).

Subgenus *Orthipomoea* Choisy (= subgenus *Calycanthemum* (Klotzsch) Hallier f.): species 1–15

Subgenus *Ipomoea*

Section *Pharbitis* (Choisy) Griseb. (= section *Chorisanthae* Hallier f.): species 16–21

Section *Ipomoea* (= section *Cephalanthae* (Choisy) Hallier f.): species 22–26

Section *Involucratae* Baker & Rendle: species 27, 28

Subgenus *Quamoclit* (Moench) Clarke (= subgenus *Leiocalyx* Hallier f., s.l.)

Section *Calonyction* (Choisy) Griseb.: species 47

Subgenus *Eriospermum* (Hallier f.) Verdc. ex D.F.AustinSection *Erpiphomoea* Choisy (= section *Leiocalyx* Hallier f., s.str.): species 29–46Section *Eriospermum* Hallier f.: species 48–54Section *Acmostemon* (Pilger) Verdc.: species 55, 56Subgenus *Poliothamnus* (Hallier f.) Verdc.: species 57

Some exotic species have escaped from cultivation and are naturalised; these are included in the main text. Several other species of *Ipomoea* are cultivated in especially the warmer parts of the region and may occasionally occur as culture relicts or garden escapes, notably the following: *I. arborescens* (Humb., Bonpl. & Kunth) G.Don (small tree with white flowers, from Mexico), *I. batatas* (L.) Lam. (the sweet potato, probably of tropical American origin), *I. coccinea* L. (annual twiner with scarlet flowers, from North America), *I. horsfalliae* Hook. (perennial twiner with pink flowers, from the West Indies), *I. intrapilosa* Rose (shrub or tree with white flowers, from Mexico), *I. quamoclit* L. (annual twiner with pinnately cut leaves and scarlet flowers, from tropical America), *I. tricolor* Cav. (perennial twiner with predominantly blue flowers, from tropical America).

Key to indigenous and naturalised species of *Ipomoea* (see Welman & Meeuse 1998) (*Stictocardia laxiflora* has been incorporated in the key because it can easily be confused with *Ipomoea*.)

1a (1b: p. 76) Leaves simple, entire, shallowly lobed, emarginate or toothed, but not pinnately, palmately or pedately lobed nearly to base, not compound:

2a Flowers in pedunculate heads, surrounded by a single large bicupitate bract:

3a Sepals lanceolate, acute, glabrous or sparsely hairy, mainly at tip and along margins; corolla distinctly funnel-shaped, 30–50 mm long, limb 30–50 mm wide . . . 27. *I. involucrata*

3b Sepals oblong to oblong-spathulate, obtuse, glabrous below tip inside; corolla tube slender, subcylindrical, ± 20 mm long, limb spreading, 15–30 mm wide 28. *I. pileata*

2b Flowers not in heads, or, if so, then heads not subtended by one large and bicupitate, boat-shaped bract:

4a (4b: p. 76) Corolla narrowly to widely funnel-shaped:

5a Leaves with minute black dots beneath; sepals ± 8 mm long, much imbricate, subequal, glabrous, obovate, obtuse (KwaZulu-Natal) *Stictocardia laxiflora*

5b Leaves without black dots (sometimes minutely pitted or pellucidly glandular):

6a Corolla small, shorter than 18 mm and/or limb narrower than ± 15 mm; flowers in fascicles, clusters or solitary, sometimes in pedunculate 1- to few-flowered cymes or heads:

7a Leaves when dry pellucidly glandular when seen in transmitted light, crisped along margin; sepals very unequal, outer ones ovate from cordate base, obtuse, markedly accrescent, crisped along margin; corolla 12–14 mm long, mauvish pink; capsule and seeds hairy 6. *I. hackeliana*

7b Leaves not pellucidly glandular:

8a Flowers in distinctly pedunculate, bracteate, dense few-flowered heads; peduncle longer than 20 mm; leaves entire, densely white-tomentose beneath; corolla up to 15 mm long, pale yellow; erect to trailing annual 22. *I. chloroneura*

8b Flowers not in pedunculate bracteate heads; if fascicled or clustered, then peduncle never longer than 20 mm:

9a Leaves hastate at base with entire or toothed basal auricles, very rarely all lanceolate; flowers solitary, rarely fasciculate; pedicel up to 12 mm; sepals linear, acuminate, hairy, 7–11 mm long; corolla pinkish mauve with darker centre, occasionally white; capsule hirsute 5. *I. gracilisepala*

9b Leaves cordate, cuneate or truncate at base, never hastate:

10a Leaves usually 3-lobed, albotomentose beneath; flowers pink to mauve-purple, in pedunculate dichasial 3–11-flowered cymes 19. *I. dichroa*

10b Leaves entire, not albotomentose:

11a Leaves cuneate to truncate-rounded, rarely subcordate at base; flowers very small, ± sessile; corolla white, hardly longer than the usually bristly calyx 1. *I. coscinosperma*

11b Leaves distinctly cordate at base:

12a Outer sepals cordate or auricled at base, attenuate into an acute apical portion; corolla ± twice as long as calyx; peduncles distinct, longer than 10 mm; inflorescences cymosely 1–3-flowered 8. *I. sinensis* subsp. *blepharosepala*

12b Outer sepals not as above; corolla slightly longer than calyx:

13a Leaf apex obtuse and minutely mucronate; petiole up to 20 mm long; inflorescences axillary, 1–3-flowered, subsessile 3. *I. leucanthemum*

13b Leaf apex acute, subacute or acuminate; petiole up to 80 mm long:

14a Flowers usually in clusters; sepals very hairy, ovate-lanceolate with linear-acuminate, spreading tip; capsule hairy; seeds glabrous 2. *I. eriocarpa*

14b Flowers solitary or in 2–5-flowered cymes; sepals obtuse or subacute, ciliate or nearly glabrous; capsule glabrous or with a few bristly hairs; seeds densely pubescent 4. *I. plebeia* subsp. *africana*

6b Corolla larger to very large, longer than 18 mm; flowers usually pedunculate:

15a Leaves bilobed at apex, coriaceous or subcoriaceous, whole plant glabrous; stems stout, trailing; growing only on sandy beaches 37. *I. pes-caprae* subsp. *brasiliensis*

15b Leaves not bilobed (sometimes emarginate) at apex, or not found on sandy beaches:

16a Leaves cordate-ovate in outline, shallowly 3-lobed, or entire, cordate, cordate-ovate or cordate-deltoid, covered with thin white cobwebby tomentum beneath (occasionally reduced to a few scattered floccose patches); flowers mauve or magenta; bracteoles and sepals lanceolate or linear-lanceolate, acute to acuminate-aristate:

17a Flowers in dense globose pedunculate heads; corolla 20–40 mm long 20. *I. wightii*

17b Flowers in few- to many-flowered dichasial or cymes, sometimes solitary:

18a Corolla 18–25 mm long 19. *I. dichroa*

18b Corolla 40–60 mm long 21. *I. ficifolia*

16b Leaves either not with white cobwebby tomentum or bracts and sepals different (and, if so, then corolla white or pale mauve):

19a Leaves linear or lanceolate with narrow or sometimes somewhat rounded base, entire, or sometimes toothed, repand, lobed or ± emarginate; plants erect to prostrate, often suffruticose:

20a Vegetative parts pubescent; calyx tomentose or pubescent:

21a Vegetative parts (at least on younger shoots) and calyx usually covered with adpressed, short, silvery pubescence:

22a Erect, much-branched shrub; leaves linear or oblanceolate, sessile or subsessile, narrowed at base; flowers solitary on very short pedicels 13. *I. oenotheroides*

22b Prostrate or suberect perennial; leaves usually distinctly petiolate, rounded or subcordate at base; flowers solitary or 2 together, peduncles 10–50 mm long 15. *I. suffruticosa*

21b Vegetative parts usually not with adpressed, short, silvery tomentum:

23a Sepals unequal; plant hairy 9. *I. crassipes*

23b Sepals equal or subequal:

24a Sepals acuminate to aristate; leaves usually long-attenuate at base and well over 50 mm long, usually also some toothed or pinnatisect, hairy or glabrous above; pubescence soft, white 7. *I. oenotherae*

24b Sepals acute or acuminate; leaves not as above:

25a Leaves shorter than 50 mm, entire, often with crisped margins, on a short petiole or subsessile, glabrous above; pubescence soft, white 14. *I. robertsiana*

25b Leaves usually longer than 50 mm, entire, hairy above and below; pubescence usually stiff, adpressed on leaves, yellowish or brownish 24. *I. oblongata*

20b Vegetative parts (at least the leaves) glabrous, stems occasionally minutely scabrid-hirsutulous:

26a Corolla white, 20–35 mm long; plant stemless or with short stem; leaves entire or with few teeth 38. *I. simplex*

26b Corolla magenta or pale mauve with darker centre, longer than 25 mm:

27a Leaves usually wider than 5 mm; corolla pale mauve with darker centre; stems usually stout, sometimes minutely scabrous or hirsutulous 39. *I. welwitschii*

27b Leaves usually narrower than 5 mm; corolla magenta; stems often slender, glabrous 40. *I. bolusiana*

19b Leaves broader, not linear or lanceolate or, if narrow, then broadly truncate, hastate, sagittate or cordate at base:

28a (28b: p. 75) Annual or perennial plants, herbaceous, prostrate or climbing, sometimes suffruticose and suberect but, if so, then lower than 500 mm, never tall and woody:

29a Stems thick, trailing, hollow or spongy, rooting at nodes; in moist, marshy, inundated localities or even completely aquatic, floating 36. *I. aquatica*

29b Stems not thick, hollow or spongy or rooting at nodes and plant not usually found in very moist localities:

30a (30b: p. 74) Leaves distinctly cordate or sagittate at base:

31a Corolla either yellow and concolorous, or white or yellow with a purple or brown centre; sepals subequal, 4–8 mm long:

32a Corolla up to 25 mm long 29. *I. obscura* var. *obscura*

32b Corolla 27 mm long or longer 30. *I. ochracea* var. *ochracea*

31b Corolla pink, mauve, magenta, purple to blue or pure white, if white or yellowish, then with purple or magenta centre; sepals very unequal and longer than 8 mm:

33a Sepals entirely glabrous:

34a Petiole short, shorter than 15 mm; leaves usually shorter than 50 mm; plant usually hairy in some part other than calyx; corolla with small tufts of hairs protruding from midpetaline areas 31. *I. transvaalensis*

34b Petiole 15–200 mm long:

35a Leaves cordate-elliptic or rounded to subreniform, obtuse with minute cusps, basal sinus narrow and deep; sepals 12–20 mm long; corolla 35–70 mm long 32. *I. bathycolpos*

35b Leaves cordate-deltoid or cordate-ovate, usually suddenly acuminate from broad, usually irregularly and coarsely few-toothed base into an entire apex, basal sinus broad; sepals 5–9 mm long; corolla 20–35 mm long 33. *I. papilio*

33b Sepals thinly to densely hairy or tomentose:

36a Sepals long-attenuate or linear-acuminate at apex, 14–25 mm long; twining herbaceous plants with retrorse hairs on stems and petioles; leaves often 3-lobed:

37a Outer sepals lanceolate at base with long and linear acumen, patently hirsute in basal portion, 17–25 mm long; cultivated and naturalised 16. *I. nil**

37b Outer sepals lanceolate to ovate-lanceolate, gradually attenuate towards apex, with adpressed pubescence, 14–22 mm long, cultivated and naturalised 18. *I. indica**

36b Sepals acute, obtuse or mucronate but not with long and narrow acumen, if sepals long-acuminate, then plant not twining and without retrorse hairs on stems and petioles:

38a Calyx with bristly patent hairs in basal portion, glabrous towards apex; twining annual with retrorse hairs on stems and petioles; cultivated and naturalised 17. *I. purpurea**

38b Calyx not with bristly patent hairs in basal portion and not glabrous towards apex:

39a Twining plant, growing in moist places (river banks, marshes, pools) often among reeds, sedges etc. 48. *I. rubens*

39b Prostrate to suberect plants, or erect shrubs:

40a Plant shrubby, erect; stems woody; sepals very broad, unequal; corolla pale mauve with magenta centre 52. *I. holubii*

40b Plants prostrate to suffruticose, if suberect, then never higher than 500 mm; corolla usually magenta:

41a Bracts usually distant from calyx, often foliaceous; sepals very unequal, outer ones ovate-acuminate, inner ones linear 9. *I. crassipes*

41b Bracts usually close to calyx, never foliaceous; sepals sub-equal:

42a Bracts ovate, acuminate 12. *I. fulvicaulis* var. *fulvicaulis*

42b Bracts linear or lanceolate, rarely broader 24. *I. oblongata*

30b (30a; p. 73) Leaves not distinctly cordate or sagittate at base:

43a Sepals entirely glabrous, sometimes rugose or muriculate:

44a Sepals 5–12 mm long:

45a Sepals 5–9 mm long; corolla magenta; leaves acuminate from broad base, coarsely toothed in lower half 33. *I. papilio*

45b Sepals 8–12 mm long; corolla pale mauve with darker centre; leaves linear-oblong to elliptic, entire, emarginate or 3-lobed, not broad or toothed at base 39. *I. welwitschii*

44b Sepals 12–25 mm long:

46a Leaves rhomboid-lanceolate in outline, margin entire to lobed; sepals 15–18 mm long; corolla pale purple or mauve 46. *I. fanshawei*

46b Leaves oblong, elliptic, ovate to linear-oblong, entire; sepals 12–25 mm long; corolla magenta 24. *I. oblongata*

43b Sepals ± hairy to tomentose:

47a Plant shrubby, erect, higher than 500 mm; sepals very broad, suborbicular, rounded, unequal, inner ones larger 52. *I. holubii*

47b Plant prostrate; sometimes suffruticose, suberect, but if so, then lower than 500 mm and sepals not very broad and rounded:

48a Flowers in pedunculate, few- to many-flowered heads (heads occasionally binate):

49a Bracteoles and sepals linear, narrow, bristly with long yellowish hairs 10. *I. pellita*

49b Bracteoles and sepals lanceolate to ovate:

50a Leaves lanceolate or ovate-lanceolate from broad base to long-triangular, gradually narrowing towards apex; corolla bright magenta, 30–50 mm long 23. *I. ommaneyi*

50b Leaves usually oblong to ovate and not often gradually tapering to apex from broad base:

51a Corolla magenta, 50 mm long or longer 24. *I. oblongata*

51b Corolla mauve or purple, 25–50 mm long 12. *I. fulvicaulis* var. *fulvicaulis*

48b Flowers solitary or 2 or 3 together, or not in heads but in cymes:

52a Sepals very unequal; outer ones ovate or lanceolate from broad base, inner ones linear; bracts usually distant from calyx and often foliaceous 9. *I. crassipes*

52b Sepals equal or not so distinctly unequal:

53a Leaves up to 45 mm long, broad at base, often subcordate; bracteoles very minute, calyx 7–8 mm long; corolla bright magenta-rose, 20–40 mm long with small tufts of hairs protruding from midpetaline areas (especially conspicuous in older buds) 31. *I. transvaalensis*

53b Leaves, bracts, sepals or corolla longer or corolla, if hairy on midpetaline areas, then without protruding hair tufts:

54a Bracteoles distant from, more rarely contiguous to calyx; leaves quite glabrous above; corolla thinly hairy to glabrous on midpetaline areas 14. *I. robertsiana*

54b Bracteoles contiguous to calyx; leaves usually hairy on both sides; corolla silky on midpetaline areas 34. *I. crispa*

28b (28a: p. 73) Tall perennial woody climbers or shrubs higher than 500 mm:

55a Calyx glabrous:

56a Sepals orbicular to oblong, obtuse; leaves usually lobed, rarely entire 49. *I. mauritiana*

56b Sepals ovate, cuspidate to acute; leaves entire, usually appearing after flowers 50. *I. shirambensis*

55b Calyx at least partly hairy or tomentose:

57a Sepals broadly elliptic or obovate to orbicular, obtuse, 5–16 mm long, two inner ones larger than outer ones; shrubs; leaves not longer than 250 mm:

58a Leaves cordate-ovate, usually shorter than 50 mm; erect shrub with ultimate twigs sometimes flexuous or twining; corolla 40–50 mm long 52. *I. holubii*

58b Leaves ovate to lanceolate, 100–250 mm long; erect to scrambling shrubs up to 3 m high; sepals suborbicular, 5–6 mm long; corolla 50–90 mm long; cultivated and seminaturalised 54. *I. carnea* subsp. *fistulosa**

57b Sepals not as above; plants climbing; leaves mostly much larger:

59a Two outer sepals cordate-triangular, 14 mm long; young parts and peduncles not densely hairy 11. *I. bisavium*

59b Two outer sepals not as above; young parts densely hairy, as are peduncles:

60a Young parts densely yellow-villous; sepals linear-lanceolate 57. *I. consimilis*

60b Young parts densely white-tomentose:

61a Young leaves with very conspicuous reticulate, somewhat floccose tomentum on main veins below, older ones glabrescent; calyx at first tomentose at least near base; corolla white, 60–90 mm long 55. *I. albivenia*

61b Young leaves with complete tomentum below, tomentum usually persistent; calyx tomentose; corolla white, rose-purple or mauve with darker throat, 60–100 mm long 56. *I. verbascoidea*

4b (4a: p. 71) Corolla salver-shaped, white or white with inside of tube purple or magenta:

62a Plant herbaceous and twining:

63a Corolla tube up to \pm 40 mm long; leaves ovate to lanceolate, entire, cuneate to rounded at base; sepals not awned 35. *I. lapathifolia*

63b Corolla tube at least 70 mm long; leaves cordate at base, entire or 3-lobed; sepals awned; cultivated and naturalised 47. *I. alba**

62b Plant not herbaceous and twining:

64a Plant shrubby, erect; calyx densely silky outside 51. *I. adenoides*

64b Plant woody and climbing; calyx glabrous; sepals obtuse 53. *I. stenosiphon*

1b (1a: p. 71) Leaves deeply lobed (nearly to base), dissected or compound:

65a Leaves albotomentose below with prominent veins, palmately 3–5- or almost 7-lobed 25. *I. magnusiana*

65b Leaves glabrous or sometimes hairy but not albotomentose:

66a Flowers in dense pedunculate and bracteate heads; leaves hairy 26. *I. pes-tigridis* var. *pes-tigridis*

66b Flowers solitary, fascicled or in cymes:

67a Corolla small, white tinged with mauve, 10–15 mm long; leaves palmately 5–7-fid with dentate or serrate to pinnatisect segments 41. *I. coptica*

67b Corolla usually larger, rarely white; leaf segments not dentate or serrate, entire or basal ones with lateral lobe:

68a Large glabrous perennial climber; leaves palmately 3–9-lobed, 60–150 \times 60–200 mm, not pseudostipulate 49. *I. mauritiana*

68b Annuals or prostrate perennials; leaves much smaller, usually narrower than 80 mm and often pseudostipulate by small leaves of developing or suppressed axillary shoots:

69a Leaves usually pseudostipulate, distinctly palmately or pedately 5–9-fid, quite glabrous; climbing or occasionally prostrate annuals:

70a Calyx 8–10 mm long; outer sepals saccate at base; corolla yellow with mauve tube, 30–60 mm long and wide; leaves usually binternately pedate, often with 9 segments 42. *I. tuberculata*

70b Calyx up to \pm 7 mm long; outer sepals not saccate; corolla mauve, purple or white; leaves palmately partite, usually with 5 segments:

71a Corolla $30–60 \times 40–60$ mm, mauve, rarely white 43. *I. cairica*

71b Corolla up to \pm 25 mm long:

72a Peduncles very slender, filiform; corolla often shorter than 16 mm, purplish mauve 45. *I. tenuipes*

72b Peduncles rather stout, not filiform; corolla 15–25 mm long, purplish mauve or white 44. *I. hochstetteri*

69b Leaves not pseudostipulate, pinnately dissected, tridentate or palmately compound; stems prostrate or rarely suberect from perennial tuberous rootstock; corolla usually longer than 30 mm:

73a Young parts and sepals with soft white hairs; sepals very acute; basal leaves, if present, linear; cauline leaves tridentate to pinnatisect or all leaves pinnatisect; flowers solitary on short peduncle, deep pink to magenta 7. *I. oenotherae*

73b Sepals glabrous:

74a Leaves palmately 3–9-fid with linear segments narrower than 5 mm (often very narrow); stems often rather slender, glabrous; corolla magenta 40. *I. bolusiana*

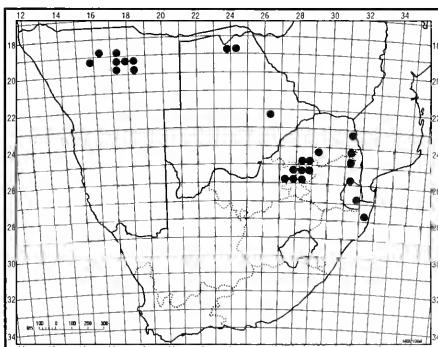
74b Leaves trisect with linear, lanceolate or oblong segments usually wider than 5 mm; stems usually stout; corolla pale mauve with magenta centre, 30–80 mm long 39. *I. welwitschii*

1. **Ipomoea coscinosperma** Hochst. ex Choisy in A.DC., Prodromus systematis naturalis ... 9: 354 (1845); Hallier f.: 124 (1893a); Baker & Rendle: 138 (1905–06); Hutch. & Dalziel: 216 (1931); A.Meeuse: 721 (1957a); Verdc.: 92 (1963a); Heine: 350 (1963); Roessler: 14 (1967a); Gonç.: 62 (1987); Gonç.: 71 (1992); Retief & P.P.J.Herman: 384 (1997). Type: Sudan, Kordofan, Kotschy 17 (G, lecto.; WAG, isosyn.).

Annual herb. Stems several, stout, glabrescent, suberect to prostrate, up to 3 m long. Leaves often secund, mostly entire, glabrescent, pilose or hairy, linear-lanceolate to oblong, 30–120 \times 5–50 mm, base cuneate, apex subacute to rounded and mucronate; petiole 5–60 mm long. Inflorescences pilose, axillary, 1- to few-flowered clusters on short peduncle, on young stems solitary, or short pedicels fasciculate; bracts hairy, \pm 4 mm long. Sepals subequal, ovate-lanceolate to lanceolate, 6–8 mm long, up to 12 mm in fruit, apex long-attenuate, covered with long, white hairs. Corolla narrowly funnel-

shaped, slightly longer than calyx, white. Capsule globose, glabrous, 6–8 mm in diameter, style base persistent. Seeds brown, shortly pubescent, \pm 3 mm long. Flowering time December to May.

Very variable species, occurring from the Sudan throughout the more arid areas of tropical



MAP 38.—*Ipomoea coscinosperma*

Africa to northern Namibia, Botswana, Swaziland and the Northern Province, Mpumalanga, Gauteng, North-West and northern KwaZulu-Natal in South Africa. Grows in grassland and in damp sand of riverine areas, also a troublesome weed in cultivated lands. Map 38.

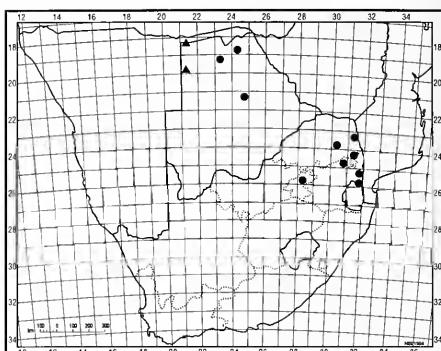
Distinguished by its cuneate leaf bases, 6–8 mm long, narrow sepals covered with long white hairs and inconspicuous corolla only slightly longer than the calyx.

Vouchers: *De Winter* 2952 (M, PRE, WIND); *Meeuse* 9019 (L, PRE); *Smith* 2196 (PRE, SRGH); *Strey* 5644 (NH, PRE); *Wiles* s.n. (PRE, Swaziland National Herbarium).

2. ***Ipomoea eriocarpa* R.Br.**, Prodromus florae novae hollandiae ...: 484 (1810); Choisy: 369 (1845); Baker & Rendle: 136 (1905–06); Ooststr.: 462 (1953); A. Meeuse: 722 (1957a); Heine: 350 (1963); Verdc.: 91, tt. 22 & 24 (1963a); Gonç.: 61 (1987); Gonç.: 69 (1992); Lejoly & Lisowski: 67 (1992); Gonç.: 21 (1996); Retief & P.P.J. Herman: 384 (1997). Type: Australia, 'New Holland', *Banks* & *Solander* s.n. (BM, holo.).

Variable annual herb. *Stems* twining or prostrate, pilose, 1–2 m long. *Leaves* cordate-lanceolate to cordate-oblong, 20–90 × 5–55 mm, thinly strigose to subglabrous, apex acuminate, nerves densely pilose; margin entire, somewhat ciliate; petiole pilose, 10–80 mm long. *Inflorescence* axillary, subsessile or peduncle up to 15 mm, 3–many-flowered. *Flowers* usually subsessile; bracteoles pilose, 3–8 mm. *Sepals* subequal, ovate-lanceolate with linear-acuminate, spreading tips, 7–8 mm long, pilose. *Corolla* tubular to funnel-shaped, white, pink or mauve, or white with mauve centre, 7–9 mm long; midpetaline areas pilose. *Capsule* subglobose, apiculate, hairy, 5–8 mm in diameter. *Seeds* glabrous, minutely punctate, 2.5–3.5 mm long, black. *Flowering time* March and April.

Found in tropical Africa and Madagascar southwards to Botswana and the northern part of South Africa. Also in the Middle East,



MAP 39.—● *Ipomoea eriocarpa*
▲ *I. leucanthemum*

throughout tropical Asia to northern Australia. Found in bushveld, savanna and grassland, also on cultivated ground, often on alluvial and sandy soils. Map 39.

Distinguished by its cordate-lanceolate or cordate-oblong leaves, dense inflorescences, very hairy sepals and corolla which is only slightly longer than the calyx.

Vouchers: *Ngoni* 421 (PRE, SRGH); *Scheepers* 234 (PRE).

3. ***Ipomoea leucanthemum* (Klotzsch) Hallier f.** in *Botanische Jahrbücher* 18: 124 (1893a); Baker & Rendle: 137 (1905–06); A. Meeuse: 722 (1957a); Roessler: 15 (1967a); Gonç.: 61 (1987); Gonç.: 70 (1992). Type: Mozambique, Tete, Rios de Sena, *Peters* II.1845 (B, holo.†).

Calycanthemum leucanthemum Klotzsch: 244, t. 40 (1861).

Much-branched annual or perennial herb. *Stems* prostrate, ascending or erect, slender, greyish pubescent, up to 800 mm long. *Leaves* linear-oblong to ovate-cordate, 20–70 mm long, base subcordate, apex obtuse and minutely mucronate, both surfaces thinly hairy; petiole up to 20 mm long, pubescent. *Inflorescence* axillary, 1–3-flowered, subsessile; bracts ovate-acuminate, pilose; pedicels up to 10 mm long,

pubescent. *Sepals* subequal, ovate or oblong-lanceolate, up to 9 mm long, pilose. *Corolla* funnel-shaped, up to 12 mm long, white or cream-coloured; midpetaline areas pilose. *Capsule* globose, pilose. *Seeds* black, appressed pubescent. *Flowering time* February and March.

Found in Malawi, Zambia, Zimbabwe, Mozambique as well as northern Botswana and northern Namibia. Grows in bushveld, savanna and grassland, also along rivers and roadsides. Map 39.

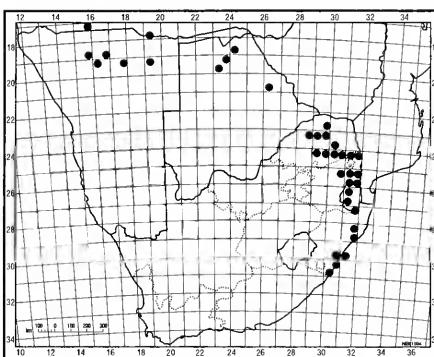
Distinguished by its obtuse and minutely mucronate leaf apex and corolla which is only slightly longer than the calyx.

Vouchers: *Merxmüller* 2051 (M, PRE, WIND); *Wild & Drummond* 6964 (K, PRE, SRGH).

4. *Ipomoea plebeia* R.Br., Prodromus florae novae hollandiae ...: 484 (1810); *Ooststr.*: 492 (1940); *Ooststr.*: 463 (1953); *A.Meeuse*: 723 (1957a); *Verdc.*: 199 (1958c); *Verdc.*: 92, t. 21 (1963a); *Roessler*: 16 (1967a); *Gonç.*: 63 (1987); *Gonç.*: 72 (1992). Type: Australia, Bay of Inlets, *Banks & Solander* s.n. (BM, holo.).

subsp. africana *A.Meeuse* in *Bothalia* 6: 723 (1957a); *Verdc.*: 199 (1958c); *Verdc.*: 94 (1963a); *Roessler*: 16 (1967a); *Gonç.*: 63 (1987); *Gonç.*: 72 (1992); *Retief & P.P.J.Herman*: 386 (1997). Type: Mpumalanga, Barberston, *Codd* 7785 (PRE, holo.); (EA!).

Annual herb. *Stems* prostrate or climbing, up to at least 1 m long, hairy. *Leaves* oblong-cordate to triangular-cordate, 20–100 × 5–65 mm, basal lobes rounded, sinus broad or narrow, rounded, apex acute or subacute, mucronate, subglabrous, margins entire, ciliate; petiole 5–70 mm long, hairy. *Inflorescence* axillary, sessile or peduncle up to 10 mm long; flowers solitary or in 2–5-flowered cymes; pedicels hairy or glabrous, 5–8 mm long; bracteoles minute. *Sepals* unequal, 5–8 mm long, obtuse or subacute, sparsely pilose, margins ciliate; three outer ones ovate-triangular, acuminate; two



MAP 40.—*Ipomoea plebeia* subsp. *africana*

inner ones linear-oblong; all accrescent. *Corolla* funnel-shaped, white with purple centre, ± 9 mm long, limb ± 9 mm wide; midpetaline areas distinct, pilose outside. *Capsule* broadly ovate to globose, style base persistent, glabrous, 6–8 mm in diameter. *Seeds* subtrigonal, brownish or greyish pubescent, 3.0–4.5 mm long. *Flowering time* February to May.

Occurs from Kenya and Tanzania southwards to northern Namibia, Botswana, the Northern Province, Mpumalanga, Swaziland and KwaZulu-Natal. Found in savanna, bushveld, grassland and alluvial zones, also as a weed along roadsides and on cultivated land. Map 40.

The species is distinguished by its cordate, subglabrous leaves, ovate-triangular outer sepals and corolla which is only slightly longer than the calyx. The subsp. *africana* is characterised by the sparsely pilose sepals and the white corolla with a purple centre. The subsp. *plebeia* occurs in Australia and Malaysia while the subsp. *indica* Verdc. occurs in India.

Vouchers: *Compton* 28730 (PRE); *De Winter & Marais* 4960 (M, PRE, WIND); *Smith* 1290 (PRE, SRGH); *Stalmans* 1073 (PRE); *Ward* 6177 (PRE, University of Durban-Westville).

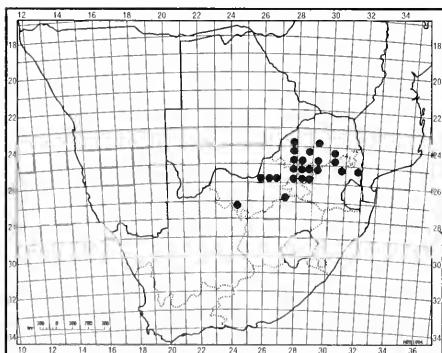
5. *Ipomoea gracilisepala* Rendle in *Journal of Botany, British and Foreign*, London 39: 12 (1901); *Baker & C.H.Wright*: 58 (1904);

A.Meeuse: t. 1217B (1956a); A.Meeuse: 725 (1957a); Gonç.: 64 (1987); Retief & P.P.J.Herman: 384 (1997). Type: Transvaal, Zeyher 1224 (BM, holo.!; LD).

I. xiphosepala Baker: 58 (1904) non Baker: 69 (1894). Type: North-West, Magaliesberg, *Burke s.n.* (SAM, iso.!).

I. gracilisepala Rendle var. *lycifolia* (Merxm.) A.Meeuse: 726 (1957a). Type: Zimbabwe, Marondera, Dehn 786 (K, holo.; SRGH!).

Annual. *Stems* several, usually prostrate, up to ± 1 m long, subterete, pubescent. *Leaves* often secund, oblong to lanceolate, 20–60 \times 5–20 mm, usually hastate-truncate or auricled at base, apex obtuse, lobes entire, bifid or with 2 or 3 teeth; margin entire to subrepand; upper surface dark green, glabrescent, lower surface paler and more densely hairy; petiole 5–10 mm long. *Inflorescence* axillary, 1- or 2-flowered, rarely fasciculate; peduncle up to 7 mm long in fruit, thinly hairy with long hairs as are bracteoles, pedicels and sepals; bracteoles linear-lanceolate, 4–7 mm long; pedicels up to 12 mm long in fruit. *Sepals* subequal, lanceolate to linear, 7–11 mm long, larger in fruit and spreading at apex, hairy. *Corolla* narrowly funnel-shaped, pinkish mauve with darker centre or rarely white, 12–16 mm long, limb spreading, almost 5-angled, 10–12 mm wide; midpetaline areas distinct, hairy towards tips. *Capsule* globose, hirsute, 6–8 mm in diameter. *Seeds* brown, tomentose, 4–5 mm long. *Flowering time* December to March.



MAP 41.—*Ipomoea gracilisepala*

Occurs in Zimbabwe and also in the northern and central parts of South Africa in the Northern Province, North-West, Gauteng and Mpumalanga. Found in grassland and damp areas near rivers, frequently in open and in semiruderal sites. Probably often overlooked because of its small flowers. Map 41.

Distinguished by its hastate leaves, linear to lanceolate, 7–11 mm long sepals and narrowly funnel-shaped, 12–16 mm long, mauve corolla.

Vouchers: *Acocks* 18751 (PRE); *Mogg* 8671 (PRE).

6. *Ipomoea hackeliana* (Schinz) Hallier f. in Botanische Jahrbücher 18: 126 (1893a); Baker & Rendle: 146 (1905–06); A.Meeuse: 726 (1957a); Roessler: 14 (1967a); Gonç.: 65 (1987); Lejoly & Lisowski: 68 (1992); Retief & P.P.J.Herman: 384 (1997). Type: Namibia, Ovamboland, Olukonda, Schinz 749 (Z, holo.; BOL!, GRA!).

Aniseia hackeliana Schinz: 274 (1888).

Annual herb. *Stems* several, prostrate, up to ± 1 m long, glabrescent. *Leaves* secund, ovate-cordate, 10–45 \times 7–35 mm, apex acute to rounded, margin crenate to crenate-dentate, crisped, sparsely pilose on both surfaces, pellucidly glandular when seen in transmitted light when dry; basal sinus wide and shallow, blade cuneately decurrent into 4–28 mm long, pilose petiole. *Flowers* solitary or in few-flowered fascicles; bracteoles ± 3 mm long; pedicel hairy, up to 20 mm long. *Sepals* unequal, hairy, ± 10 mm long, green suffused with purplish red; three outer ones ovate from cordate base; two inner ones lanceolate; all accrescent, becoming papyraceous with distinct veins, up to 15 mm long. *Corolla* funnel-shaped, pale mauvish pink with darker centre or occasionally white, 12–14 mm long. *Capsule* subglobose, densely pilose with long white hairs, 6–8 mm in diameter. *Seeds* black, hairy, 3.5 mm long. *Flowering time* January to April. Figure 14.

Found in southern Zimbabwe, northern Namibia, Botswana and also in the Northern Province and Northern Cape in South Africa.

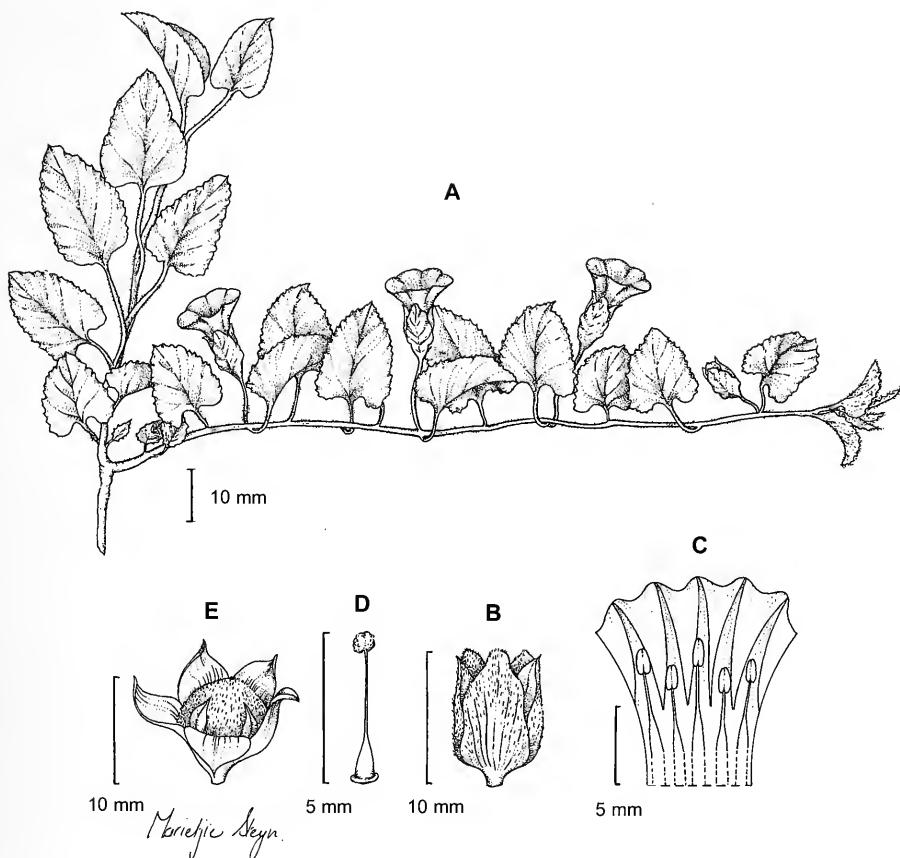


FIGURE 14.—*Ipomoea hakeleana*: A, flowering stem and root (*Skarpe* S226, PRE); B, calyx; C, inside of corolla tube with stamens; D, ovary, style and stigma (*Van Rooyen & Bredenkamp* 561, PRE); E, fruit with calyx (*Barnard* 242, PRE). Artist: Marietjie Steyn.

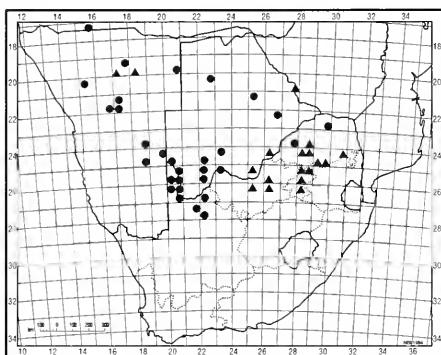
Grows in open woodland, savanna and along roadsides, often on sandy soil. Map 42.

Distinguished by its ovate-cordate leaves with crimped margins (when dry pellucidly glandular when seen in transmitted light), ovate-cordate outer sepals with crimped margins and 12–14 mm long, mauve corolla.

Vouchers: *Barnard* 242 (PRE); *Leistner* 1822 (PRE); *Meeuse* 10600 (PRE); *Van Vuuren & Giess* 1136 (M, PRE, WIND).

7. *Ipomoea oenotherae* (Vatke) Hallier f. in *Botanische Jahrbücher* 18: 125 (1893a); Baker & C.H.Wright: 49 (1904); Baker & Rendle: 145 (1905–06); A.Meeuse: 727 (1957a); Verdc.: 200 (1958c); Verdc.: 95 (1963a); Roessler: 16 (1967a); Gonç.: 65 (1987); Lejoly & Lisowski: 69 (1992); Retief & P.P.J.Herman: 385 (1997). Type: Kenya, Kitui, *Hildebrandt* 2767 (B, holo.†).

Convolvulus oenotherae Vatke: 520 (1882).



MAP 42.—● *Ipomoea hackeliana*
▲ *I. oenotherae*

I. petunioides Baker: 63 (1904). Type: Transvaal, Schoon River, Burke s.n. (K. holo.).

Perennial with a fusiform rootstock up to \pm 300 mm long, producing an annual rosette of leaves. Stems unbranched, many, prostrate or ascending, up to 400 mm long, thick, angular, older parts glabrescent, younger parts silvery white-pubescent. Radical leaves entire, linear to lanceolate, 40–100 mm long, or with 1–7 lateral teeth or lobes, terminal lobe distinctly longer than the others; petiole up to 70 mm long. Cauline leaves 20–60 mm, entire or 3–7-lobed, base cuneate, lobes linear to lanceolate, entire to somewhat repand, hairy, soon glabrescent, middle lobe the longest, main nerves prominent below; petiole 5–40 mm long. Flowers axillary, solitary, subsessile, or pedicel 5–15 mm long; bracteoles linear, pubescent, 10–15 mm long. Calyx often rose-red, 12–15 mm long; sepals unequal, ovate to ovate-lanceolate, aristate, ciliate with median keel of hairs, broader and brown in fruit. Corolla narrowly funnel-shaped with spreading limb, 30–50 mm long, deep pink to magenta, glabrous. Capsule globose, glabrous, straw-coloured, 8–10 mm in diameter. Seeds 3–4 mm long, densely pubescent, often pinkish grey. Flowering time November to March.

From Ethiopia and Somalia southwards to Namibia, Botswana and the Northern Province, North-West and Gauteng in South Africa, nowhere common and not gregarious. Growing

in mixed bushveld, grassland and also along roadsides and on cultivated ground, often on sandy or rocky soils. Map 42.

Distinguished by the soft white hairs on the sepals and young parts, linear to pinnatisect leaves with the middle lobe the longest and the 30–50 mm long, pink corolla. The var. *angustifolia* Verdc. (1958c: 200) from Uganda and Kenya might be superfluous as the material under that name is not clearly distinct from other material of this variable species. The above description refers to the typical variety.

Vouchers: Brueckner 578 (PRE); De Winter 2877 (M, PRE, WIND); Ngoni 239 (K, PRE, SRGH); Welman 517 (PRE)

I. petunioides Baker: 63 (1904). Type: Transvaal, Schoon River, Burke s.n. (K. holo.).

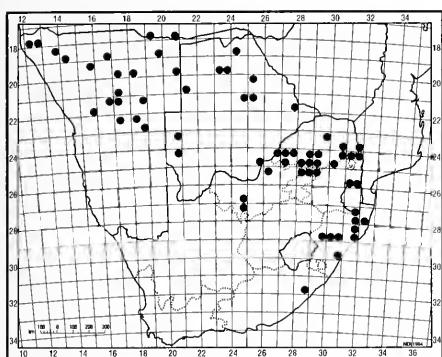
8. *Ipomoea sinensis* (Desr.) Choisy in Mémoires de la Société de Physique et d'Historie Naturelle de Genève 6: 459 (1834). Type: China, Yangnouw (?), Moreau s.n. (P-JU 6773, holo., PRE, photo.!).

subsp. *blepharosepala* (Hochst. ex A.Rich.) Verdc. ex A.Meeuse in Bothalia 6: 729 (1957a); Verdc.: 101 (1963a); Roessler: 16 (1967a); Gonç.: 72 (1987); A.E.van Wyk & S.Malan: 250 (1988); Gonç.: 80 (1992); Lejoly & Lissowski: 77 (1992); Retief & P.P.J.Herman: 386 (1997). Type: Ethiopia, Simen, Meda, Schimper 1780 (P, holo.).

I. blepharosepala Hochst. ex A.Rich.: 72 (1851).

I. cardiosepala Hochst. ex Baker & C.H.Wright: 61 (1904), non Meisn.: 265 (1869).

Annual herb. Stems several, suberect to prostrate or twining, pilose, up to \pm 2 m long. Leaves cordate-oblong to cordate-ovate, 30–80 \times 20–50 mm, entire, apex obtuse or acute, mucronate, basal lobes rounded, sinus usually deep and narrow, upper surface green, thinly pilose to almost glabrous, lower surface more densely hairy and paler, margin ciliate; petiole 10–90 mm long, densely pilose. Inflorescence cymosely 1–3-flowered; peduncle hairy, 10–60 mm long; bracteoles minute; pedicels 5–20 mm long, pilose, reflexed in fruit. Sepals very unequal,

MAP 43.—*Ipomoea sinensis* subsp. *blepharosepala*

5–8 mm long, accrescent in fruit, ciliate with long white hairs, apex very acute and lanceolate; outer ones cordate or auricled at base; inner ones much narrower. *Corolla* funnel-shaped, usually mauve with darker mauve to magenta centre, midpetaline areas well-defined, strigose outside, 8–12 mm long, limb 15–20 mm wide, spreading. *Capsule* globose, apiculate, style base persistent, glabrous, \pm 10 mm in diameter, straw-coloured. *Seeds* 4–5 mm long, densely hairy, grey or fawn. *Flowering time* September to July, mostly December to May.

Throughout tropical Africa and also in Arabia and on Socotra. It extends into Namibia, Botswana, Swaziland and the Northern Province, North-West, Gauteng, Mpumalanga, KwaZulu-Natal and the Eastern Cape in South Africa. Common in bushveld, savanna, grassland and also along roadsides and on cultivated land, becoming a weed on disturbed ground, on sandy and calcareous soils. Map 43.

Distinguished by its cordate-oblong to cordate-ovate leaves, cordate or auricled outer sepals and 8–12 mm long, mauve corolla. The typical subspecies occurs in tropical Africa as well as tropical Asia. It is distinguished by its up to 22 mm long, white corolla and larger sepals (in fruit up to 9 \times 23 mm). Gonçalves (1987: 72) cites *Exell, Mendonça & Wild 1467* from northern Botswana at the Chobe-Zambezi confluence, but it does not seem to have been collected further south in southern Africa.

Vouchers: *Codd 8618* (PRE); *Compton 28615* (PRE); *De Winter & Marais 4958* (M, PRE, WIND); *MacDonald 3A* (PRE, SRGH); *Zambatis 1322* (PRE).

9. *Ipomoea crassipes* Hook. in Curtis's Botanical Magazine 70: t. 4068 (1844b); Hallier f.: 44 (1899a); Rendle: 14 (1901); Baker & C.H.Wright: 56 (1904); Baker & Rendle: 147 (1905–06); A.Meeuse: 730 (1957a); Verdc.: 98 (1963a); A.Batten & G.W.Bokelmann: 123, t. 98 (1966); Roessler: 14 (1967a); Gonç.: 69 (1987); A.E.van Wyk & S.Malan: 200 (1988); Gonç.: 77 (1992); Lejoly & Lisowski: 76 (1992); A.Fabian & Germish.: 334, t. 159d (1997); Retief & P.P.J.Herman: 384 (1997); W.G.Welman: 72 (1999b). Type: North-West, Magaliesberg, Burke 177 (K, neo.; BOL, iso-neo.!).

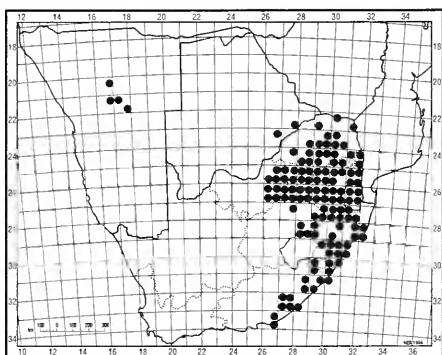
Aniseia calystegioides E.Mey. ex Choisy: 431 (1845). Type: Eastern Cape, between Gekau and Bashee rivers, Drège s.n. (K, iso.).

I. greenstockii Rendle: 38 (1896). Type: Mpumalanga, Pilgrim's Rest, Greenstock s.n. (BM, holo.).

I. bellecomans Rendle: 15 (1901). Type: Gauteng, Pretoria, Zeyher 1213 (BM, holo.; LD!).

I. sarmentacea Rendle: 15 (1901). Type: Mpumalanga, Pilgrim's Rest, Greenstock s.n. (BM, holo.).

Nearly glabrous to hairy laticiferous perennials with brownish black, tuberous, fusiform taproot up to \pm 100 mm in diameter. *Stems* annual, several from base, usually all ultimately prostrate, up to 750 mm long. *Leaves* very variable in shape and size, usually lanceolate to ovate, 15–80 \times 3–28 mm, apex acute to obtuse, base usually truncate to rounded, entire; petiole up to \pm 10 mm long. *Peduncles* usually 1-flowered; bracts leafy, variable in size and shape, ovate-lanceolate or lanceolate-oblong, 5–20 mm long; pedicels usually shorter than 20 mm. *Sepals* unequal, 10–28 mm long, outer ones ovate, \pm triangular or lanceolate, base often subcordate, inner ones linear. *Corolla* funnel-shaped, mauve to purple with lighter midpetaline areas, also pink or white with dark purple centre, 30–45 mm long, 35–60 mm wide. *Capsule* ovoid-globose, glabrous, apiculate, 8–10 mm in diameter. *Seeds* glabrous or pubescent, \pm 6 mm long.



MAP 44.—*Ipomoea crassipes*

Flowering time September to April, mostly November to January.

Occurs from Kenya southwards through Tanzania, Malawi, Zambia, Angola, Zimbabwe and Mozambique to southern Africa (except the Western and Northern Cape), where it is common. Grows in bushveld and savanna but mostly in grassland on sandy soil. Map 44.

Distinguished by its prominent, leafy bracts, unequal sepals and 30–45 mm long, pinkish corolla. This extremely variable species is conceivably an aggregate taxon. It would seem that all specimens from southern Africa could belong to the typical variety.

Can also occur as a weed. According to Watt & Breyer-Brandwijk (1962: 308), the root is used medicinally.

Vouchers: Compton 29163 (PRE); Dieterlen 452 (PRE); Giess 12613 (M, PRE, WIND); Hansen 3077 (GAB, PRE, SRGH); Scheepers 1366 (PRE).

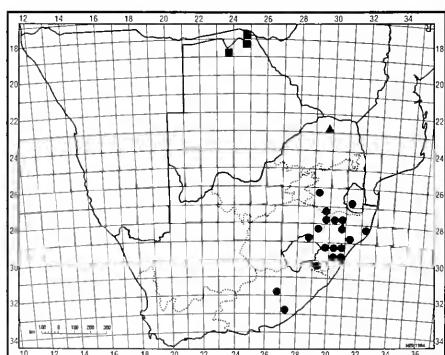
10. *Ipomoea pellita* Hallier f. in Botanische Jahrbücher 18: 130 (1893a); A. Meeuse: 732 (1957a); Retief & P.P.J. Herman: 385 (1997). Type: Transkei, between Gekau and Bashee rivers, Drège 4905 (G, W, iso., teste Hallier f.).

I. ovata E.Mey. ex Rendle: 19 (1901). Type: KwaZulu-Natal, between Umtentu and Umzimkulu rivers, Drège s.n. (LD, holo.).

I. ovata E.Mey. ex Rendle var. *pellita* (Hallier f.) Baker in Baker & C.H. Wright: 54 (1904). Type as for *I. pellita*.

Perennial with a thick fusiform rootstock. Stems several from base, prostrate, herbaceous, robust, densely bristly hairy, up to 2 m long. Leaves ovate to oblong, 40–100 × 20–65 mm, entire, apex subacute to rounded, often mucronate, base shallowly cordate or rounded to truncate, densely yellowish hairy when young, glabrescent when old, margin with dense hairs; petiole hairy, shorter than blade. Peduncle 30–150 mm, bristly; flowers usually in a terminal dense few-flowered head; bracteoles linear, bristly, 12–25 mm; pedicels mostly absent. Sepals subequal, very bristly, 18–25 mm long, almost similar to bracteoles, accrescent in fruit. Corolla funnel-shaped, 40–70 mm long and wide, magenta, slightly hairy on mid-petaline areas. Capsule subglobose, apiculate, glabrous, 12–15 mm in diameter. Seeds ± 10 mm long, dark brown, glabrous. Flowering time September to April, mostly November to February.

Endemic to the eastern parts of southern Africa in Mpumalanga, Swaziland, the eastern Free State, KwaZulu-Natal, Lesotho and the Eastern Cape, often in grassland. Map 45.



MAP 45.—● *Ipomoea pellita*
▲ *I. bisavium*
■ *I. fulvicaulis* var. *fulvicaulis*

Distinguished from related taxa, e.g. *I. oblongata* (no. 24), by its bristly, strictly linear bracteoles and sepals and dense inflorescences on long peduncles.

According to Watt & Breyer-Brandwijk (1962: 309), the leaf is used medicinally.

Vouchers: *Comins* 1902 (PRE); *Jacobsz* 1828 (PRE); *Meeuse* 9064 (PRE); *Strey* 9502 (NH, PRE); *Wells* 2029 (PRE).

11. ***Ipomoea bisavium* A.Meeuse** in Bothalia 7: 26 (1958a); A.Meeuse: t. 1360 (1961); Retief & P.P.J.Herman: 383 (1997). Type: Northern Province, Wyllie's Poort, *Meeuse* 10181 (PRE, holo.); BM, BR, EA, K, L, SRGH, iso.); Northern Province, Wyllie's Poort, *Meeuse* 10237 (PRE, iso.).

Tall perennial climber. *Stems* woody, older parts with dark, rough bark, young twigs \pm herbaceous, hairy. *Leaves* subcordate, subentire, apex mucronate and \pm acuminate, base cordate to subtruncate, basal lobes rounded, both surfaces minutely adpressed-puberulous, \pm glabrescent; main nerves slightly prominent beneath; blade 30–70 \times 15–50 mm; petiole densely adpressed-puberulous, 10–30 mm long. *Inflorescence* axillary, cymosely 1- to few-flowered; peduncle densely adpressed-puberulous, up to 70 mm long; pedicels somewhat pubescent, faintly striate, 5–25 mm long; bracteoles 6 \times 2–3 mm, early deciduous. *Sepals* unequal, glabrescent; 2 outer sepals cordate-triangular, 14 mm long; third sepal \pm asymmetrical 10–11 mm long, innermost two oblong-lanceolate, 9–10 mm long. *Corolla* funnel-shaped, pale pink to white, lower portion of tube purple-mauve inside; tube glabrous, \pm 25 mm long, limb spreading, 5-angled, 40–60 mm wide; midpetaline areas strigose-pilose with white hairs on outside. *Capsule* ovoid-conical, glabrous, brown, 10–12 \times 8 mm. *Seeds* 4, \pm 4.5 mm long, shortly velutinous with 7 mm long fulvous hairs on angles. *Flowering time* April.

Endemic to the Wyllie's Poort area in the Soutpansberg in the Northern Province. Known

only from the type collection; the flowering specimens (*Meeuse* 10181) and the fruiting specimens (*Meeuse* 10237) are from the same plant. Map 45.

Distinguished by being a woody climber with cordate-triangular outer sepals and pale pink to white corolla.

Vouchers: *Meeuse* 10181 (PRE); *Meeuse* 10237 (PRE).

12. ***Ipomoea fulvicaulis* (Hochst. ex Choisy) Boiss. ex Hallier f.** in Botanische Jahrbücher 18: 128 (1893a); Baker & Rendle: 143 (1905–06). Type: Ethiopia, Mt Sholoda, near Adowa, *Schimper* 270 (G, holo.); BM, K, P.

Aniseia fulvicaulis Hochst. ex Choisy: 431 (1845).

var. **fulvicaulis**.

Verdc.: 338 (1960); Verdc.: 97, t. 22 (1963a); Gonç.: 68 (1987); Gonç.: 75 (1992); Lejoly & Lisowski: 74 (1992); A.Meeuse & W.G.Welman: 46 (1996).

Perennial herb with woody rootstock. *Stems* twining or erect, up to 2 m long, yellow-brown-pubescent. *Leaves* oblong to elliptic-ovate, 30–115 \times 10–45 mm, apex obtuse to emarginate, base cordate to truncate, upper and lower surfaces densely pubescent; petiole very hairy, 10–52 mm long. *Flowers* axillary, several in small heads; peduncles 10–75 mm long, hairy; bracts ovate, acuminate, up to 19 mm long. *Sepals* ovate, acuminate, pilose, up to 16 mm long. *Corolla* funnel-shaped, \pm pilose, 25–50 mm long, mauve or purple. *Capsule* globose, glabrous. *Seeds* brownish, pubescent. *Flowering time* August to March.

From Ethiopia, Kenya, Tanzania, Malawi, Democratic Republic of the Congo, Zambia and Zimbabwe to Mozambique, also in northern Botswana. Found in woodland, open forest, grassland and along roadsides, often on dry stony ground. Map 45.

Distinguished by its yellow-brown-pubescent stems, flowers which are in small heads and 25–50 mm long, purplish corollas. The var.

heterocalyx (Schulze-Menz) Verdc. and var. *asperifolia* (Hallier f.) Verdc. do not reach southern Africa.

Voucher: *Pope, Biegel & Russell* 808 (K, SRGH).

13. *Ipomoea oenotheroides* (L.f.) Raf. ex Hallier f. in *Botanische Jahrbücher* 18: 156 (1893a) in syn; A.Meeuse & W.G.Welman: 47 (1996). Type: Cape Province, *Sparrman* s.n. (S, syn.!).

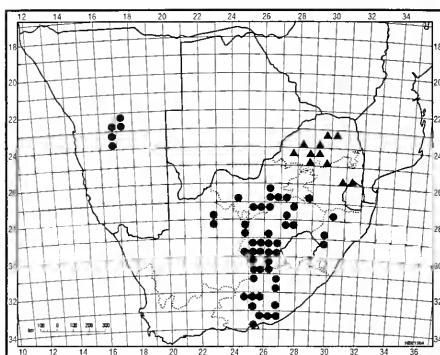
Convolvulus oenotheroides L.f.: 137 (1782). *Rivea oenotheroides* (L.f.) Hallier f.: 156 (1893a). *Turbina oenotheroides* (L.f.) A.Meeuse: 775 (1957a); A.Batten & G.W.Bokelmann: 122, t. 98 (1966); A.E.van Wyk & S.Malan: 202 (1988); Retief & P.P.J.Herman: 388 (1997).

I. argyreoides Choisy: 357 (1845). Type: North-West, Magaliesberg, Toverfontein, Zeyher 1207 (LD, holo.).

I. barrettii Rendle: 190 (1902). Type: Free State, near Vredefort, *Barrett-Hamilton* s.n. (K, holo.).

Much-branched perennial shrub, up to 1 m high, with slender fusiform tuberous roots up to 1.25 m long. Stems stout and woody at base, with a very short silvery, adpressed pubescence like young parts, petioles, lower surface of leaves, peduncles, bracteoles, pedicels and calyx, very old parts glabrescent, suberete to almost angular. Leaves entire, linear to oblanceolate or lanceolate, 30–110 × 2–30 mm, base decurrent into the 0–6 mm long petiole, apex acute to obtuse, mucronate. Peduncles 1-flowered, up to 15 mm long; bracteoles small; pedicels up to 10 mm long. Sepals subequal, lanceolate, 8–25 mm long. Corolla funnel-shaped, 35–70 mm long and wide, bright magenta or magenta-pink; midpetaline areas usually densely silvery hairy. Capsule ovoid or ovoid-globose, apiculate, style base persistent, dark-brown, glabrous, 15–20 mm long. Seeds 1–3, brown to black, glabrous, ± smooth, ± 9 mm long. Flowering time November to March.

Endemic to southern Africa. Found in Namibia and central parts of South Africa in North-West, Mpumalanga, the Free State, KwaZulu-Natal, and the Northern and Eastern Cape. Common in more arid parts of the sum-



MAP 46.—● *Ipomoea oenotheroides*
▲ *I. robertsiana*

mer-rainfall area. Apparently mostly in open sites with a rather severe winter climate. Map 46.

Distinguished by being an erect shrub with linear to oblanceolate leaves and a 35–70 mm long, magenta corolla.

Vouchers: *Acocks* 11095 (PRE); *Merxmüller* 870 (M, PRE, WIND); *Pentz* 462 (PRE); *Van Wyk* 733 (PRE, PUC); *Zietsman* 5 (NMB, PRE).

14. *Ipomoea robertsiana* Rendle in *Journal of Botany, British and Foreign*, London 39: 18 (1901); Baker & C.H.Wright: 50 (1904); A.Meeuse & W.G.Welman: 47 (1996). Type: Mpumalanga, Pilgrim's Rest, *Greenstock* s.n. (BM, holo.).

Turbina robertsiana (Rendle) A.Meeuse: 777 (1957a); A.Fabian & Germish: 334, t. 159j (1997); Retief & P.P.J.Herman: 388 (1997).

I. uncinata Hutch.: 337 (1946). Type: Northern Province, Pietersburg, *Hutchinson* 2285 (K, holo.; BOL).

Perennial with a 10–50 mm thick rootstock. Stems prostrate, suffruticose, simple or branched, terete or angular, up to 1.2 m long, sparsely covered with stiff, white, spreading hairs (same pubescence found on petioles, lower surface of leaves and leaf margins, peduncles, bracts, pedicels and sepals). Leaves linear-lanceolate to ovate-oblong, 10–35 × 3–18

mm, often with crisped margin and folded on midrib, apex recurved, mucronate, base narrowed to rounded, glabrous above; petiole 1–13 mm long. *Peduncles* 1-flowered, 5–40 mm long; bracts linear, 4–20 mm long; pedicels up to 3 mm long. *Sepals* subequal, 13–21 mm long, linear-lanceolate to ovate-lanceolate, apex acute to aristate. *Corolla* funnel-shaped, 50–70 mm long, magenta; midpetaline areas usually sparsely hairy. *Capsule* subglobose, apiculate, style base often persistent, glabrous, finely striate, \pm 10 mm in diameter, enclosed by calyx, indehiscent. *Seeds* 1 or 2, \pm 6 mm long, shortly and densely greyish brown-hairy. *Flowering time* November to April.

Endemic to the Northern Province and Mpumalanga. Grows in bushveld and savanna, often on sandy soil. Map 46.

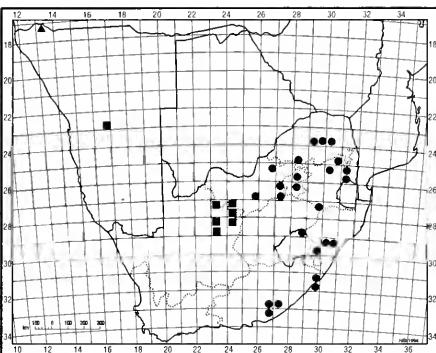
Ipomoea robertsiana is very similar in appearance to some forms of *I. oblongata* (no. 24), but can be distinguished by its white pubescence (often yellowish in *I. oblongata*), glabrous upper leaf surface and velutinous seeds. It is also very similar to *I. crispa* (no. 34) which is hairy on the upper surface of the leaves and, moreover, is endemic to the Eastern Cape.

Vouchers: *Mbedzi* 1512 (PRE); *Welman* 527 (PRE).

15. **Ipomoea suffruticosa** Burch., Travels in the interior of southern Africa, 2: 226 (1824); Choisy: 357 (1845) (excl. syn); Baker & C.H.Wright: 51 (1904); A.Meeuse & W.G.Welman: 47 (1996). Type: Northern Cape, Griqualand-West, Griqua Town, *Burchell* 1838 (K, holo.).

Turba suffruticosa (Burch.) A.Meeuse: 776 (1957a); Retief & P.P.J.Herman: 388 (1997). Type as above.

Perennial with thick fusiform taproot. *Stems* several, suffruticose, prostrate to suberect, up to \pm 1 m long; silvery subtomentose as are all young parts, petioles, peduncles, pedicels and calyx. *Leaves* lanceolate-oblong to elliptic-oblong, apex obtuse to acute, recurved mucronate, base rounded to truncate or subcordate, 20–70 mm long, fairly densely hairy



MAP 47.—■ *Ipomoea suffruticosa*
▲ *I. nil*
● *I. purpurea*

beneath, less densely to glabrescent and somewhat verrucose above; petiole 4–15 mm long. *Peduncles* 10–50 mm long, mostly 1-flowered; pedicel 2–10 mm long; bractoles lanceolate to oblanceolate, 8–15 mm long, outer surface densely hairy. *Sepals* subequal, lanceolate or oblong, apex acute or acuminate, 14–17 mm long, inner ones sometimes shorter. *Corolla* funnel-shaped, pink-purple with darker centre, 40–50 mm long, 40–50 mm wide; midpetaline areas shortly hairy. *Capsule* subglobose, apiculate, style base persistent, glabrous, dark brown, \pm 10 mm long. *Seed* 1, minutely puberulous. *Flowering time* November to April. Figure 15.

Occurs in Namibia, the dry central area of South Africa in North-West and the Northern Cape, and perhaps also southern Botswana. On sandy soils, but not common. Map 47.

Distinguished from the closely related *I. oenotheroides* (no. 13) by its distinctly petioled leaves and prostrate and unbranched stems.

Vouchers: *Acocks* 1495 (PRE); *De Winter* 2561 (M, PRE, WIND).

16. ***Ipomoea nil** (L.) Roth, Catalecta botanica quibus plantae novae ... 1: 36 (1797); Hallier f.: 136 (1893a); Ooststr.: 465 (1953); A.Meeuse: 733 (1957a); Verde.: 231 (1957c);

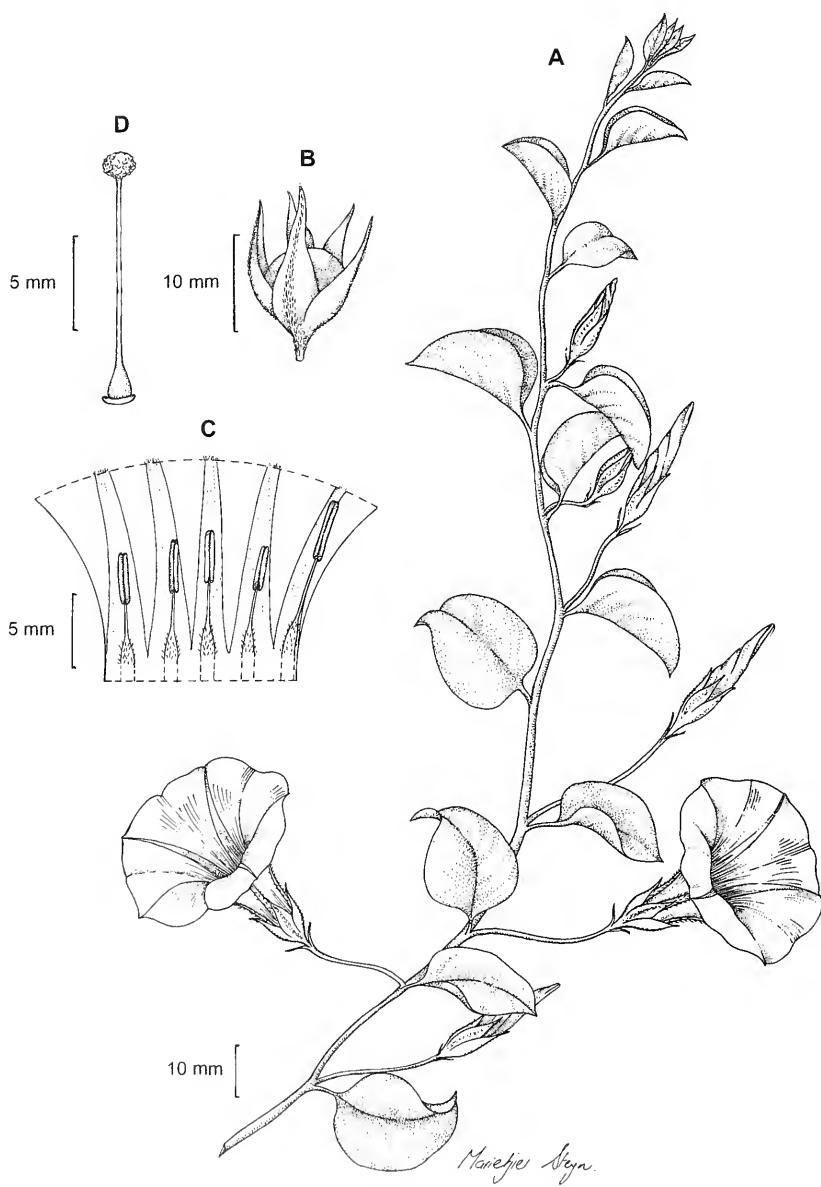


FIGURE 15.—*Ipomoea suffruticosa*: A, flowering stem (*Acocks 1495*, PRE); B, fruit with calyx (*Marloth 978*, PRE); C, inside of corolla tube with stamens; D, ovary, style and stigma (*De Winter 2561*, PRE). Artist: Marietjie Steyn.

Verdc.: 84 (1958d); Verdc.: 113 (1963a); D.F.Austin: 356 (1986); Gonç.: 86 (1987); Lejoly & Lisowski: 58 (1992); Retief & P.P.J.Herman: 385 (1997). Iconotype: illustration of *Convolvulus caeruleus hederaceo folio magis anguloso* in Dill.: t. 80, fig. 91 (1732), from Virginia and Carolina, U.S.A.

Convolvulus nil L.: 219 (1762).

C. hederaceus L.: 154 (1753). Lectotype: Linnaeus herb. 218.8 (non *I. hederacea* Jacq.).

Herbaceous annual. *Stems* usually twining, with retrorse hairs on stems and petioles. *Leaves* ovate to orbicular in outline, apex acuminate, base broadly cordate, entire or 3-lobed; margin entire; both surfaces thinly to densely pubescent; 40–140 × 30–130 mm; petiole 30–160 mm long. *Inflorescence* a 1- to few-flowered umbellate cyme; peduncle hirsute, 20–120 mm long; bracteoles 5–10 mm long; pedicels 5–10 mm long, hairy. *Sepals* subequal, up to 35 mm in fruit, linear-lanceolate, apex long-attenuate, basal portion densely and patently hirsute. *Corolla* funnel-shaped, glabrous, 50–90 mm long, 40–70 mm wide, pale to bright blue turning purple or reddish magenta, rarely white, always paler outside. *Capsule* ovoid to globose, apiculate, glabrous, 8–15 mm long. *Seeds* up to 6.5–8.0 mm long, black, puberulous. *Flowering time* February to April.

Originally tropical American, several cultivars often planted as ornamentals in warm and temperate regions and then becoming naturalised on waste ground, grassland and in secondary thickets. Only one naturalised record from the Kaokoveld, Namibia, also from tropical Africa. Apparently cultivated only in the KwaZulu-Natal coastal area. Map 47.

Distinguished from the closely related *I. purpurea* (no. 17) and *I. indica* (no. 18) by its sepals with narrow elongate green tips much longer than the body and sepals which are hispid-pilose on the back, the hairs mostly with swollen bases.

Vouchers: *Merxmüller & Giess* 30576 (M, PRE, WIND).

17. ****Ipomoea purpurea* (L.) Roth**, Botanische Abhandlungen ... : 27 (1787); Hallier f.: 137 (1893a); Ooststr.: 465 (1953); A.Meeuse: 734 (1957a); Verdc.: 231 (1957c); Verdc.: 84 (1958d); Verdc.: 114 (1963a); D.F.Austin: 357 (1986); Gonç.: 87, t. 22 (1987); A.E.van Wyk & S.Malan: 200, 250 (1988); Gonç.: 93, t. 21 (1992); Lejoly & Lisowski: 59, t. 5 (1992); Gonç.: 24, t. 7 (1996); Retief & P.P.J.Herman: 386 (1997). Iconotype: illustration of *Convolvulus folio cordato glabro flore violaceo* in Dill.: t. 84, fig. 97 (1732), from Carolina, U.S.A.

Convolvulus purpureus L.: 219 (1762).

I. gerrardiana Rendle: 21 (1901). Type: KwaZulu-Natal, Ladysmith, *Gerrard* 620 (NH, iso.).

Herbaceous annual. *Stems* trailing or twining, glabrous to retrorsely hairy. *Leaves* broadly ovate to suborbicular, 40–150 × 25–120 mm, entire or very rarely 3-lobed, apex acuminate, base cordate with rounded auricles, hairy to glabrous on both surfaces; petiole retrorsely hairy, 20–150 mm long. *Inflorescence* axillary, cymosely 1- to few-flowered; peduncle hairy, 30–180 mm long; bracteoles linear, up to 7 mm long; pedicels hairy, up to 20 mm long in fruit. *Sepals* unequal, 10–15 mm long, up to 20 mm in fruit, acute, with bristly patent hairs in basal portion, outer ones oblong, inner ones ± linear. *Corolla* funnel-shaped, glabrous, 50–60 mm long, ± 60 mm wide, white, pink, magenta, reddish purple or purplish blue with paler tube and distinct midpetaline areas. *Capsule* globose, ± 10 mm wide, glabrous. *Seeds* subglabrous, black. *Flowering time* November to May.

Native to the warmer parts of the Americas, but now cultivated as an ornamental in many parts of the world and probably widely naturalised in the tropics, also tropical Africa and South Africa. A fast-growing weed on waste or cultivated ground, also in bushveld, savanna and grassland. Map 47.

Distinguished from the closely related *I. indica* (no. 18) and *I. nil* (no. 16) by its oblong outer sepals with slightly narrowed green tips, sepals which are hispid-pilose on the back, the hairs mostly with swollen bases.

Used medicinally (Watt & Breyer-Brandwijk 1962: 309). The cultivated forms sometimes have variegated flowers.

Vouchers: *Crosby* 185 (PRE); *Jacot Guilmard* 9518 (GRA, PRE); *Marais* 804 (PRE).

18. ****Ipomoea indica* (Burm.f.) Merr.**, An interpretation of Rumphius's Herbarium amboinense: 445 (1917); Fosberg: 151 (1967); D.F.Austin: 357 (1986); Lejoly & Lisowski: 58 (1992); A.Meeuse & W.G.Welman: 48 (1996). Iconotype: illustration of *Convolvulus indicus flore violaceo* in Besler, Hort. Eyst. Aest. Ord. 13, Vol. 8, fig. 2 (1613).

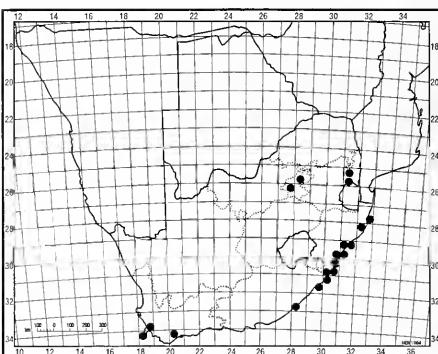
Convolvulus indicus Burm.f.: 6 (1755).

I. congesta R.Br.: 425 (1810); J.M.Wood & M.S.Evans: 75, t. 93 (1899); A.Meeuse: 735 (1957a); Retief & P.P.J.Herman: 384 (1997). Type: Australia, Queensland, Cape York Peninsula, Endeavour River, Banks & Solander s.n. (BM, holo.).

I. acuminata (Vahl) Roem. & Schult.: 228 (1819); Verdc.: 113 (1963a). Type: West Indies, Santa Cruz, West s.n. (not found at C).

I. indica (Burm.f.) Merr. var. *acuminata* (Vahl) Fosberg: 38 (1976); Gonç.: 86 (1987).

Herbaceous climber, at least sometimes perennial. *Stems* terete or subangular, pilose to glabrescent, up to several metres long, can root at nodes when prostrate. *Leaves* cordate to orbicular in outline, 40–170 × 30–160 mm, entire, apex acuminate and mucronate, base cordate, rarely broadly 3-lobed nearly to middle, margin entire, lower surface often densely hairy, upper surface less densely hairy; petiole hairy, 20–180 mm long. *Peduncles* pilose, 5–200 mm long, 1–several flowers in axillary cymes; pedicels 2–15 mm long, bracteoles linear to rarely foliaceous. *Sepals* unequal, glabrous to adpressed, hairy, particularly at base, lanceolate to ovate-lanceolate, 14–22 mm long, apex attenuate or acuminate, inner ones narrower. *Corolla* funnel-shaped, 50–80 mm long and wide, glabrous, bluish or reddish purple, limb darker than tube, tube whitish at base. *Capsule* globose, glabrous. *Seeds* black, glabrous. *Flowering time* throughout the year, mostly in spring and summer.



MAP 48.—*Ipomoea indica*

Circumtropical plant of doubtful (perhaps American) origin, often cultivated as an ornamental. Found naturalised in Gauteng, Mpumalanga, Swaziland, KwaZulu-Natal, the Eastern and Western Cape. Often occurring as a weed in waste places and roadsides. Introduced to southern Africa about a century ago. Map 48.

Distinguished from the closely related *I. nil* (no. 16) and *I. purpurea* (no. 17) by its glabrous or adpressed hairy lanceolate sepals and trichomes which are slender and soft. Keeler & Kaul (1979: 946) studied the petiolar nectaries in this species.

Vouchers: *Bajinath* 131 (PRE, UDW); *Flanagan* 549 (PRE); *Henderson* 1147 (PRE); *Meeuse* 9031 (PRE).

19. ***Ipomoea dichroa* Choisy in A.DC., Prodromus systematis naturalis ... 9: 364 (1845); Verdc.: 165 (1978); Gonç.: 84 (1987); Gonç.: 91 (1992); Lejoly & Lisowski: 50 (1992); Gonç.: 23 (1996); A.Meeuse & W.G.Welman: 48 (1996). Type: Senegal, *Geoffroy* s.n. (P, holo.).**

I. arachnospurma Welw.: 588 (1859); A.Meeuse: t. 1203 (1956b); A.Meeuse: 736 (1957a); Verdc.: 112 (1963a); Roessler: 13 (1967a); Retief & P.P.J.Herman: 383 (1997). Type: Angola, Luanda, *Welwitsch* 6243 (BM, COI, iso.).

Annual. *Stems* several from base, stout and firm, usually twining, up to 2.5 m long, bristly yellowish hairy like petioles, peduncles, pedi-

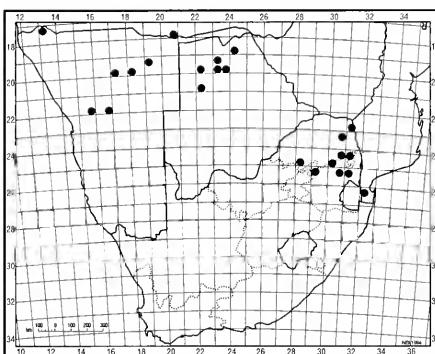
cels, bracteoles and sepals. *Leaves* broadly cordate-ovate in outline, up to 130 mm wide, usually digitately 3-lobed to \pm the middle, green and thinly hairy above, densely silvery white cobwebby tomentose beneath except on veins; central lobe ovate to suborbicular, narrowed to base, lateral lobes oblique; basal sinus acuminate, apex acute or acuminate, margin entire, ciliate; petiole up to 70 mm long. *Inflorescence* a 3–11-flowered cyme; peduncle 30–60 mm long; bracteoles ovate-lanceolate, 9–12 mm long; pedicels up to 10 mm long. *Sepals* subequal, lanceolate, 10–13 mm long, enlarged in fruit. *Corolla* funnel-shaped, pink or mauve with darker mauve centre, 14–20 mm long and wide, pubescent on midpetaline areas near tips of corolla lobes, otherwise glabrous. *Capsule* ovoid, subglabrous, \pm 8 mm wide. *Seeds* ovoid, \pm 4 mm long, black, velvety white-pubescent. *Flowering time* March to May.

Occurs throughout most of tropical Africa and India. Extends into Namibia and Botswana, southeastwards to Swaziland. Grows in riverine forest, thickets, secondary savanna, grassland and clearings, sometimes weedy along roadsides and on cultivated land, often on sandy soil. Map 49.

Ipomoea dichroa can be distinguished by its albotomentose lower leaf surface with prominent, glabrous main veins and bristly, yellowish hairs on the sepals. Some researchers regard it as perhaps no more than a small-flowered form of *I. ficiifolia* (no. 21) from which it does not seem to differ ecologically or geographically.

Vouchers: *Culverwell* 721 (PRE); *De Winter & Marais* 4612 (M, PRE, WIND); *Smith* 1291 (K, PRE, SRGH); *Van der Schijff* 2624 (PRE).

20. ***Ipomoea wightii* (Wall.) Choisy** in Mémoires de la Société de Physique et d'Histoire Naturelle de Genève 6: 470 (1834); Choisy: 364 (1845); Baker & Rendle: 157 (1905–06); A.Meeuse: 737 (1957a); Verde.: 110, fig. 22 (1963a); Gonç.: 81 (1987); Gong.: 87 (1992); Lejoly & Lisowski: 49 (1992); Retief & P.P.J.Herman: 386 (1997). Type: India,

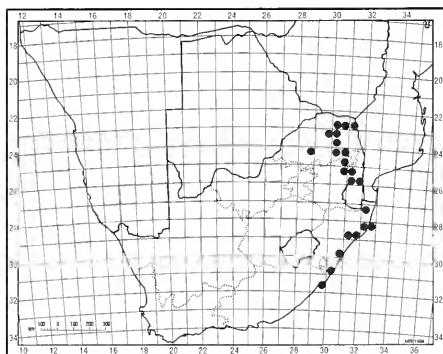


MAP 49.—*Ipomoea dichroa*

cultivated at Calcutta from seed from Nilgiri Hills, Wight in Wallich 1406 (K, holo.; G).

Convolvulus wightii Wall.: 55, t. 171 (1831).

Variable herbaceous perennial. *Stems* twining or prostrate, pilose with yellowish or brownish hairs, up to 3 m long. *Leaves* ovate-cordate in outline, 30–130 \times 25–120 mm, entire to 3-lobed to \pm middle, apex acute to acuminate, basal lobes broadly rounded, sinus deep and narrow, green and strigose above, densely flocose-cobwebby tomentose beneath, veins on lower surface conspicuous with yellowish hairs, margin entire to distinctly repand; petiole pilose, up to 90 mm. *Inflorescence* a dense, head-like pedunculate cyme; peduncle hairy, 30–130 mm long; bracteoles lanceolate, hirsute, 10–12 mm long; pedicels \pm wanting. *Sepals* equal, linear-lanceolate, 8–15 mm long, with 3 kinds of indumentum, white-cottony tomentum, adpressed or spreading yellow bristles and sessile or stalked marginal glands (one or more of these kinds may be absent). *Corolla* funnel-shaped, purple, mauve or magenta, 20–40 mm long and limb as much wide; midpetaline areas well defined, glabrous or sparsely hairy. *Capsule* subglobose, 8–10 mm long, slightly to densely bristly or with faint white tomentum. *Seeds* ovoid, dark brown, \pm 3 mm long, very shortly pubescent or glabrous. *Flowering time* throughout the year, mostly January to May.

MAP 50.—*Ipomoea wightii*

Occurs in tropical Asia and Madagascar, also from Kenya southwards to the Northern Province, Mpumalanga, KwaZulu-Natal and Eastern Cape. Grows in forest, bushland, grassland and on river banks, often on sandy soil. Map 50.

The above description refers to the var. *wightii*. The var. *kilimandschari* (Dammer) Verdc. and the var. *obtusisepala* Verdc. occur in tropical East Africa. *I. wightii* is closely related to *I. ficiifolia* (no. 21) and *I. dichroa* (no. 19), but can be recognised by its dark-edged, glandular bracts and sepals, and also by the fine reticulate pattern of veins on the whitish lower leaf surface.

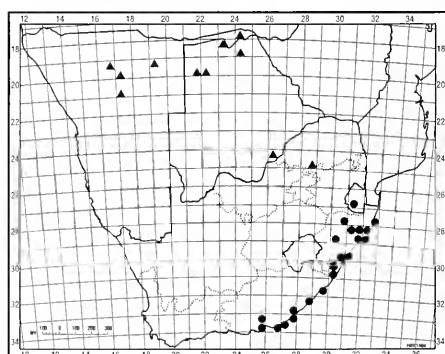
Vouchers: Stalmans 305 (PRE); Venter 2452 (PRE).

21. *Ipomoea ficiifolia* Lindl. in Botanical Register 26: 90 (1840); Lindl.: t. 13 (1841); Hallier f.: 135 (1893a); Hallier f.: 35 (1899b); Baker & C.H.Wright: 64 (1904); J.M.Wood: t. 525 (1912); A.Meeuse: 738 (1957a); Verdc.: 111 (1963a); A.Batten & G.W.Bokelmann: 123, t. 98 (1966); A.Batten: 230 (1986); Gonç.: 83 (1987); Gonç.: 90 (1992). Type: a plant cultivated in the Victoria Nursery, Bath, England, Nov. 1840 (CGE, holo.).

Convolvulus trilobus Thunb.: 35 (1794), non Desr. (1792). Type: Cape Province, Humansdorp?, Thunberg s.n. (U, holo.).

Perennial with tuberous root. *Stems* usually climbing, herbaceous becoming woody, up to 2.5 m long, often striate, sparsely hairy becoming scabridulous in older parts. *Leaves* ovate-cordate to suborbicular-reniform in outline, 20–90 × 15–80 mm, base cordate, sinus broad and shallow, apex acute or acuminate, margin ± crenate, entire or frequently 3-lobed, divided up to middle, terminal lobe ovate to ovate-triangular, constricted at base, basal lobes rounded, obliquely ovate to semi-orbicular, upper surface green, thinly hairy, lower surface mostly flocosely or cobwebby tomentose with soft white hairs when young except on yellow-bristly veins, glabrescent when older; petiole striate, hairy, 10–50 mm long. *Inflorescence* lax, cymosely 1-many-flowered; peduncle pilose, 20–150 mm long; bracteoles hairy, linear-lanceolate, 7–11 mm long; pedicels up to 15 mm long. *Sepals* equal, hairy, lanceolate, 10–15 mm long. *Corolla* funnel-shaped, 40–60 mm long, limb as much wide, shallowly 5-lobed, pale magenta, pink or purple, glabrous or with a few pilose hairs on midpetaline areas. *Capsule* sub-globose to ovoid, 7–9 mm in diameter, usually glabrous. *Seeds* compressed-globose, 3–4 mm long, yellow-pubescent, often with long white hairs on edges. *Flowering time* November to June, mostly March to May.

Occurs from Somalia, Kenya, Tanzania and Mozambique to Swaziland, KwaZulu-Natal and

MAP 51.—● *Ipomoea ficiifolia*
▲ *I. chloroneura*

the Eastern Cape. Found in bushland, littoral scrub and grassland, mostly on rocky or sandy soil, often along the coast. Sometimes a weed of cultivated ground. Map 51.

Distinguished by its long, narrow, eglandular sepals and 40–60 mm long corolla.

Used medicinally, according to Watt & Breyer-Brandwijk (1962: 308).

Vouchers: *Comins 1003* (PRE); *Compton 28759* (PRE); *Strey 6560* (NH, PRE).

22. ***Ipomoea chloroneura* Hallier f.** in *Botanische Jahrbücher* 18: 132 (1893a); Baker & C.H.Wright: 52 (1904); Baker & Rendle: 153 (1905–06); N.E.Br.: 122 (1909); A.Meeuse: 739 (1957a); Verdc.: 107 (1963a); Roessler: 13 (1967a); Gonç.: 79 (1987); Retief & P.P.J.Herman: 383 (1997). Type: Angola, Pungo Andongo, *Welwitsch* 6181 (B, holo.†; BM, COI!, G).

Annual herb, up to 300 mm high. *Main stem* branched from base; branches erect to decumbent, up to 450 mm long, densely covered with adpressed short white hairs and spreading golden-yellow hairs when young (as are petioles and peduncles). *Leaves* oblong to elliptic-obovate, 20–100 × 7–35 mm, entire, apex obtuse to acuminate, base cuneate, upper surface with adpressed white hairs, lower surface much more densely so, but veins with stiff golden-yellow hairs, yellowish hairs on margin; petiole 5–30 mm long. *Inflorescence* a small, dense, few-flowered head; peduncle 20–70 mm long; outer bracts foliaceous, resembling young leaves, up to 30 mm long in fruit; inner bracts smaller. *Sepals* subequal, lanceolate to elliptic, ± 6 mm long, aristate, central portion densely hairy, apex hairy, accrescent in fruit. *Corolla* funnel-shaped, pale yellow-green to almost white, up to ± 15 mm long; midpetaline areas tufted with white hairs. *Capsule* globose or ellipsoid, glabrous, 6–8 mm long. *Seeds* 3–4 mm long, densely silvery pubescent. *Flowering time* January to May.

Found in Tanzania, Zambia, Zimbabwe, Angola, southwards to Namibia, Botswana and the Northern Province. Grows in bushveld, savanna and grassland, often on sandy soil. Map 51.

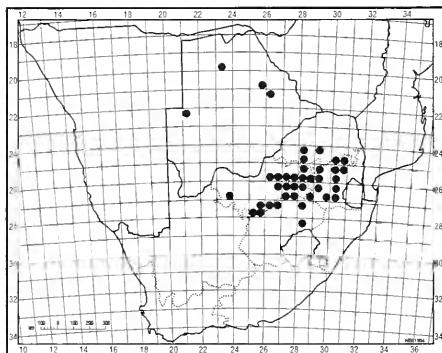
Distinguished by its entire leaves with silvery white pubescent undersides with prominent main veins.

Vouchers: *Galpin M235* (PRE); *Killick & Leistner 3293* (PRE); *Wild & Drummond 6900* (PRE, SRGH).

23. ***Ipomoea ommaneyi* Rendle** in *Journal of Botany, British and Foreign*, London 40: 190 (1902) ('ommanei'); Baker & C.H.Wright: 53 (1904); A.Meeuse: 740 (1957a); Gonç.: 79 (1987); A.E.van Wyk & S.Malan: 200 (1988); Gonç.: 86 (1992); Retief & P.P.J.Herman: 385 (1997); W.G.Welman: 72 (1999b). Type: Gauteng, Johannesburg, *Ommaney* s.n. (BM, holo.).

Perennial with a fusiform tuberous taproot, 1 m × 250 mm. *Stems* annual, several, herbaceous, trailing, up to 2 m long or more, younger parts densely pubescent. *Leaves* secund, ovate-lanceolate or oblong-lanceolate, up to 300 × 120 mm, base rounded or subcordate, apex subobtuse or acuminate, margin crisped, densely yellow-ciliate, both surfaces densely silvery white-hairy, main and lateral nerves prominent below; petiole stout, 5–50 mm long, densely hairy. *Peduncles* densely hairy, up to ± 100 mm long. *Flowers* several in dense head; outer bracts ovate or ovate-subspathulate, acuminate-cuspidate, 25–30 mm long, densely silvery hairy; inner bracts smaller. *Sepals* unequal, 30–35 mm long, lanceolate to linear-lanceolate, densely silvery hairy. *Corolla* funnel-shaped, 30–50 mm long, bright rose-magenta; midpetaline areas white and densely silvery outside. *Capsule* globose, enclosed in calyx, ± 10 mm in diameter. *Seeds* 4, dull black, glabrous. *Flowering time* October to February.

Grows in Zambia, Zimbabwe and Mozambique and southwards to Botswana and the central areas of South Africa in the Northern Province, North-West, Gauteng, Mpumalanga



MAP 52.—*Ipomoea ommaneyi*

and the Free State. Common in grassland, also along roadsides, often on rocky or sandy soil. Map 52.

According to Watt & Breyer-Brandwijk (1962: 308), the tuber is edible.

This taxon may well be a luxuriant form of *I. oblongata* (no. 24) or even a subspecies or variety of that species. Typical *I. ommaneyi* can be distinguished by its silvery pubescent, lanceolate leaves with yellowish hairs on the leaf edges and by its dense inflorescences.

Vouchers: *Burtt-Dayv* 13883 (PRE); *Joffe* 604 (PRE); *Skarpe* S298 (PRE); *Werger* 279 (PRE).

24. *Ipomoea oblongata* E.Mey. ex Choisy in A.DC., *Prodromus systematis naturalis* ... 9: 368 (1845); Hallier f.: 127 (1893a); Baker & C.H.Wright: 57 (1904); A.Meeuse & W.G.Welman: 47 (1996); W.G.Welman: 72 (1999b). Type: Eastern Cape, between Chalumna & Buffalo Rivers, *Drège* s.n. (G, holo.).

Turbina oblongata (E.Mey. ex Choisy) A.Meeuse: 778 (1957a); A.Meeuse: t. 1301 (1959); Letty: 276, t. 138 (1962); B.Jeppe: 64, t. 38 (1975); Gonç.: 124 (1987); A.E.van Wyk & S.Malan: 202 (1988); Gonç.: 127 (1992); A.Fabian & Germish: 334, t. 159 (1997); Retief & P.P.J.Herman: 388 (1997). Type as above.

I. oblongata E.Mey. ex Choisy var. *hirsuta* Rendle: 16 (1901). Type: North-West, Magaliesberg, *Zeyher* 1208

(BM, holo.: BOL!); North-West, Magaliesberg, *Burke* 179 (TCD, holo.; SAM!).

I. lambtoniana Rendle: 16 (1901). Type: KwaZulu-Natal, near Ladysmith, *Gerrard* 622 (TCD, holo.; BM).

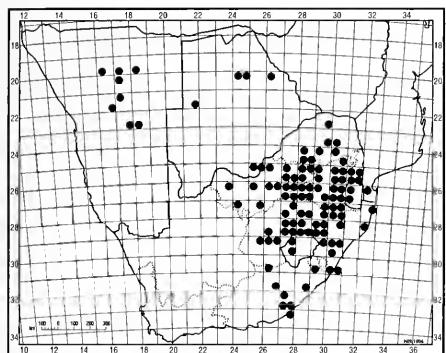
I. atherstonei Baker: 53 (1904); A.Meeuse: 741 (1957a); Retief & P.P.J.Herman: 383 (1997). Type: Mpumalanga, Middelburg, Nazareth, *Atherstone* s.n., not found in BM or K.

I. seineri Pilg.: 297 (1908). Type: Namibia, Eona, Oijherero, Rietfontein-Nord, *Seiner* II.382 (B, holo.†).

Perennial with large fusiform tuberous root, up to 1 m long. Stems several, annual, up to 2 m long, prostrate, mostly angular, often stout, ± zigzag, usually (like petioles, leaves, peduncles and calyx), pubescent with yellowish or brownish hairs, rarely glabrous. Leaves variable in size and shape, usually oblong or elliptic, varying to ovate or linear, 20–150 × 4–80 mm, entire, base usually subcordate to rounded, apex acute to emarginate, margin ciliate, upper surface usually yellowish strigose, lower surface as thinly or more densely so; petiole usually shorter than leaf. Peduncles 1–several-flowered, usually shorter than leaves; bracteoles mostly lanceolate, hairy, a little shorter than sepals; pedicels not longer than 6 mm. Sepals subequal, lanceolate to ovate-lanceolate, acute or acuminate, outer ones densely hairy, inner ones less hairy, 12–25 mm long. Corolla funnel-shaped, 35–70 mm long and ± as wide, magenta; mid-petaline areas usually thinly silky hairy. Capsule indehiscent, subglobose, apiculate, style base persistent, glabrous, dark brown, loosely enclosed by sepals, 12–15 mm in diameter. Seeds 1–4, glabrous, punctate to smooth, grey, ± 7 mm long. Flowering time October to April, mostly December and January.

Recorded from Zimbabwe and Mozambique to Namibia, Botswana and the central and eastern parts of southern Africa. Grows in bushveld, savanna, grassland, often on wet and sandy soils, sometimes regarded as a weed. Ripe seeds are very rare because of insect damage. Map 53.

A very common and very variable species. There are no important morphological differences between typical *I. oblongata* and the plants previously known as *I. atherstonei*; there

MAP 53.—*Ipomoea oblongata*

is no geographical or ecological separation either. In the 2530 and 2531 grids, a form with cordate leaves, leafy bracts and few-flowered inflorescences is found, e.g. Kluge 372 (Lowveld Botanic Garden, PRE). Typical *I. oblongata* can be recognised by the yellowish or brownish pubescence on the leaves and other parts, and by its prostrate stems with secund leaves. The narrow-leaved form from Mpumalanga is usually subglabrous, with single-flowered inflorescences.

The tuber is reported to be edible and the plant is also used as a charm and in snuff and traditional medicine (Watt & Breyer-Brandwijk 1962: 308, 310).

Vouchers: Codd 8619 (PRE); Drummond 8840 (PRE, SRGH); Giess 8340 (M, PRE, WIND); Meeuse 10100 (PRE); Schmitz 8289 (PRE).

25. *Ipomoea magnusiana* Schinz. Verhandlungen des Botanischen Vereins der Provinz Brandenburg, Berlin 30: 272 (1888); Hallier f.: 135 (1893a); Baker & C.H.Wright: 65 (1904); Baker & Rendle: 162 (1905–06); A.Meeuse: 742 (1957a); Roessler: 15 (1967a); Gonç.: 85 (1987); A.E.van Wyk & S.Malan: 200 (1988); Gonç.: 92 (1992); A.Meeuse & W.G.Welman: 48 (1996); Retief & P.P.J.Herman: 385 (1997). Type: Namibia, Oukkonda, Schinz 752 (Z, holo.; GRA).

I. eenii Rendle: 21 (1901). *I. magnusiana* Schinz var. *eenii* (Rendle) A.Meeuse: t. 1201 (1956c); Letty: 276, t. 137 (1962); Retief & P.P.J.Herman: 385 (1997). Type: Namibia, Damaraland, *Een s.n.* (BM, holo.).

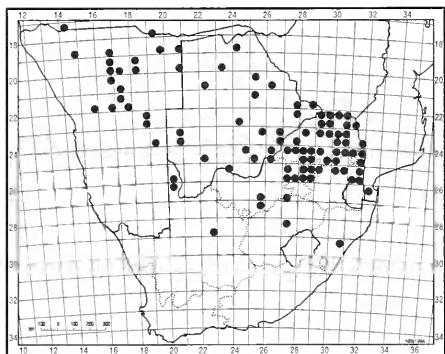
I. lugardii N.E.Br.: 163 (1905). Type: Botswana, Ngamiland, Kgwebe Hills, *Lugard 211* (K, holo.).

I. otijkangensis Pilg. & Dinter in Pilg.: 296 (1908). Type: Namibia, Okahandja, Barmen, Otjikange, *Dinter 517* (GRA, PRE, SAM, WAG, iso!).

Perennial with a thin, woody taproot. Stems annual, several to many, suberect, twining or prostrate, several metres long, slender, pilose. Leaves palmately 3- or 5-lobed nearly to base, 20–140 mm wide, basal sinus rounded or obtuse, thinly pilose above, densely white cobwebby tomentose below, except on the conspicuous main nerves which have yellowish or brownish hairs; lobes linear-lanceolate to obovate or broader, lateral lobes in 3-lobed leaves with an extra rounded lobe or auricle; margins subentire, ciliate; petiole 20–80 mm long, pilose. Inflorescence a dense, 1- to few-flowered head; peduncle pilose, up to 100 mm long; bracts hairy, linear to lanceolate, up to 15 mm long; pedicels very short. Sepals subequal, hairy outside, 6–15 mm long, lanceolate. Corolla funnel-shaped, magenta-purple, mauve or cream-coloured with darker magenta centre, rarely completely white, 12–32 mm long, limb spreading 20–40 mm wide; midpetaline areas pilose. Capsule subglobose, glabrous, 6–8 mm in diameter. Seeds pubescent, 4–5 mm long, hairs often arranged in small tufts, sometimes with long white hairs on angles in upper half. Flowering time September to July, mostly January to March.

Found in Zimbabwe and Mozambique and also in Namibia, Botswana, Swaziland and mainly central and northern South Africa. Grows in forest, bushveld, savanna, grassland and also along roadsides, often on sandy soil. Map 54.

Distinguished by its palmately lobed leaves with densely white-tomentose undersides. Two varieties were distinguished in Meeuse (1957a: 742, 743), based mainly on the size of the corolla. It now appears that the var. *eenii* cannot be

MAP 54.—*Ipomoea magnusiana*

upheld; the dimensions of the corolla overlap one another and all other features just about agree. The large-flowered specimens are presumably merely luxuriant individuals that grew in favourable sites or after heavy rains.

Vouchers: *Codd* 9326 (PRE); *Drummond* 8000 (PRE, SRGH); *Marais* 67 (PRE); *Merxmiller & Giess* 30292 (M, PRE, WIND); *Ward* 4753 (PRE, UDW).

26. *Ipomoea pes-tigridis* L., Species plantarum, 1st edn: 162 (1753); *Choisy*: 363 (1845); *Hallier* f.: 134 (1893a). Type: Sri Lanka, *Hermann* 4: 82 (BM, lecto.).

var. *pes-tigridis*.

Baker & Rendle: 158 (1905–06); *Hutch. & Dalziel*: 218 (1931); *Ooststr.*: 504 (1940); *Ooststr.*: 467 (1953); *A.Meeuse*: 744 (1957a); *Verdc.*: 108 (1963a); *Heine*: 347 (1963); *Roessler*: 16 (1967a); *Gonç.*: 81, t. 21 (1987); *Gonç.*: 88, t. 20 (1992); *Lejoly & Lisowski*: 46, t. 3 (1992); *Retief & P.P.J.Herman*: 385 (1997).

I. pes-tigridis L. var. *africana* *Hallier* f.: 539 (1898a). Type: Zanzibar, *Hildebrandt* 1347 (B, lecto.†; BM, isolec-to.).

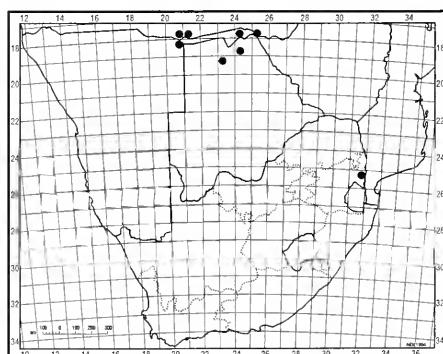
Annual or sometimes perennial herb. Stems trailing, with long spreading yellow bristly hairs (as have petioles and peduncles), 0.5–2.0 m long. Leaves orbicular to almost reniform in outline, base broadly cordate, palmate-pedately 5–11-lobed, 30–90 × 40–120 mm, segments oblong to

elliptic, apex acute, base narrow, thinly pilose on both surfaces; petiole 15–100 mm long. Inflorescence a bracteate few-flowered head; peduncle 20–180 mm long, outer bracts foliaceous, linear-oblong to oblong, 15–30 mm long, densely hirsute-pilose, inner bracts smaller. Sepals lanceolate, pilose-hirsute, 7–12 mm long. Corolla funnel-shaped, white to blue or purple with darker throat, 30–55 mm long, limb as much wide, sparsely pilose on midpetaline areas. Capsule ovoid, brown, glabrous, ± 8 mm long. Seeds brown with a white pubescence, ± 4 mm long. Flowering time January to March. Figure 16.

Found in tropical Asia, the Mascarene Islands and tropical Africa, southwards to northern Namibia, northern Botswana and Mpumalanga. Grows in forest, savanna, bushveld, grassland, along rivers and on cultivated ground, often on sandy soil and also as a semi-ruderal. Map 55.

A number of varieties have been described, but they hardly seem to deserve separate status. The material from southern Africa would fit into the typical variety. Distinguished by the long, spreading, yellow, bristly hairs on the slender stems, petioles and peduncles, the deeply lobed leaves and also by the hairy, foliaceous bracts.

Vouchers: *Barnard* 305 (PRE); *De Winter* 4603 (PRE); *Van der Schijff* 1775 (PRE).

MAP 55.—*Ipomoea pes-tigridis* var. *pes-tigridis*

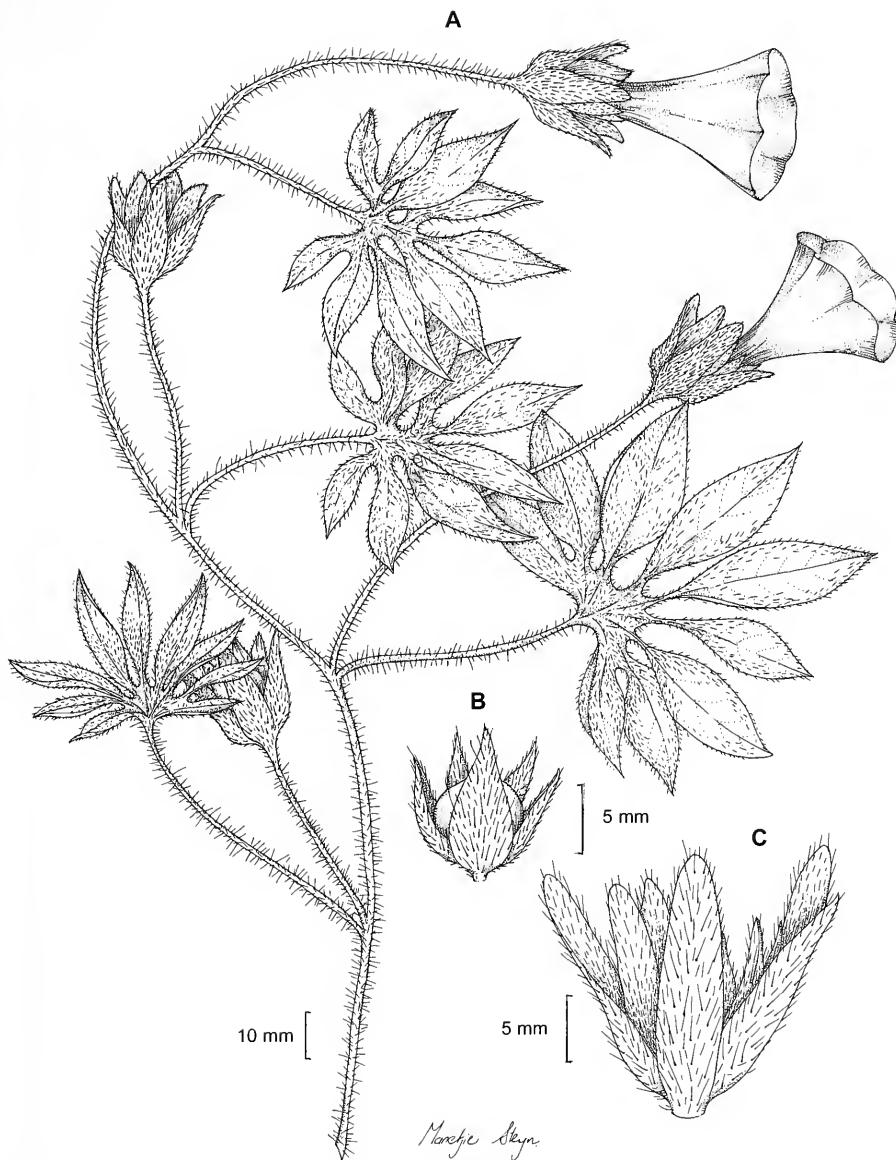


FIGURE 16.—*Ipomoea pes-tigridis* var. *pes-tigridis*: A, flowering stem (*De Winter* 4176, PRE); B, fruit with calyx; C, bracts and calyces of inflorescence (*De Winter* & *Marais* 4603, PRE). Artist: Marietjie Steyn.

27. **Ipomoea involucrata** P.Beauv., Flore d'Oware et de Bénini en Afrique 2: 52, t. 89 (1817); Choisy: 365 (1845); Baker & Rendle: 150 (1905–06); Hutch. & Dalziel: 218 (1931); A.Meeuse: 744 (1957a); Verdc.: 206 (1958c); Verdc.: 104 (1963a); Heine: 347, t. 283 (1963); Gonç.: 75 (1987); Gonç.: 83 (1992); Lejoly & Lisowski: 53 (1992); Retief & P.P.J.Herman: 384 (1997). Type: Nigeria, Oware, Beauvois s.n. (G, holo.).

Very variable annual or perennial herb. *Stems* twining, hairy to glabrescent, up to 4 m long. *Leaves* cordate-ovate, 20–80 × 15–70 mm, entire, apex mucronate and attenuate-acuminate to obtuse, basal lobes and sinus rounded, thinly hairy on both surfaces; petiole pilose, 13–80 mm long. *Inflorescence* a dense head; peduncle 20–120 mm long; outer bracts connate into large pubescent foliaceous boat-shaped involucre 30–60 mm long, 8–15 mm wide, with 2 cusps; inner bracts small, linear-oblong to obovate, flowers few- to many, shortly pedicellate. *Sepals* sparsely hairy or glabrescent; outer ones lanceolate, acute, ± 12 mm long; inner ones shorter and ovate. *Corolla* funnel-shaped, purple, rose-red, mauve, white or white with pink throat, 30–50 mm long and wide; midpetaline areas minutely pilose. *Capsule* glabrous, globose, 6 mm wide. *Seeds* pubescent or glabrous, blackish, 3.5–4.0 mm long. *Flowering time* December to September.

Throughout tropical Africa, extending into the Northern Province where it is rare. Grows in forest, bushveld and grassland as well as disturbed places. Map 56.

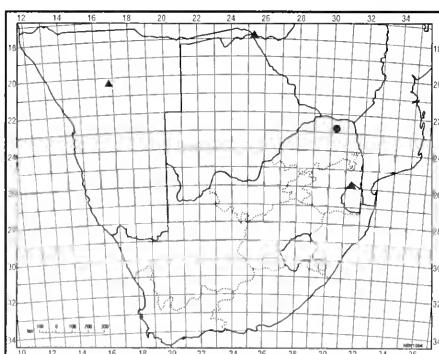
According to Verdcourt (1958c: 206), there are three varieties of *I. involucrata*; only var. *involucrata* occurs in southern Africa. Distinguished by its foliaceous boat-shaped involucre and 30–50 mm long flowers. Ugborogho & Ogunwenmo (1995) studied the biology of this species in Nigeria.

Vouchers: *Galpin* 9463 (PRE); *Jacobs* 43 (PRE).

28. **Ipomoea pileata** Roxb., Flora indica; or descriptions of Indian plants ... 2: 94 (1824); Choisy: 365 (1845); Baker & C.H.Wright: 53 (1904); Baker & Rendle: 151 (1905–06); Ooststr.: 507 (1940); Ooststr.: 467 (1953); A.Meeuse: 745 (1957a); Verdc.: 105 (1963a); Heine: 347 (1963); Gonç.: 76, t. 20 (1987); Gonç.: 84, t. 19 (1992); Lejoly & Lisowski: 55, t. 4 (1992); Retief & P.P.J.Herman: 385 (1997). Type: plant cultivated at Calcutta from Chinese seed, *Wallich* 1376 (K, holo.; G).

I. involucrata sensu Hallier f.: 135 (1893a) ex parte, excl. type.

Annual or sometimes perennial herb with thick fusiform taproot. *Stems* twining, hairy to glabrescent, up to 3 m long. *Leaves* cordate-ovate, 20–100 × 15–75 mm, entire, apex attenuate-acuminate to obtuse, rounded basal lobes and sinus, thinly hairy on both surfaces; petiole pilose, 15–100 mm long. *Inflorescence* a few- to many-flowered involucrate head; peduncle pilose, 20–50 mm long; outer bracts connate into large, pubescent boat-shaped involucre 25–40 mm long with 2 cusps; inner bracts oblong or elliptic, obtuse, ± 15 mm long. *Sepals* unequal, hairy; 3 outer ones oblong to oblong-spathulate, apex obtuse, ± 10 mm long; inner ones much narrower, apex acute, 9 mm long. *Corolla* salver-shaped, pink or white with a darker centre or purple, tube slender, ± 20 mm long; limb spreading, 15–30 mm wide; midpetaline areas sparsely pilose. *Capsule* ovoid,



MAP 56.—● *Ipomoea involucrata*

▲ *I. pileata*

glabrous, 6 mm long. *Seeds* glabrous or thinly pubescent, ovoid, \pm 4 mm long, black. *Flowering time* March to June.

Occurs in tropical Africa, the Mascarene Islands and also in tropical Asia. Rather rare in northern Namibia, northern Botswana and Mpumalanga. Found in open patches in rain forest, bushland, grassland and on river banks, on rocky and sandy soil. Can be a weed along roadsides and on cultivated land. Map 56.

This species is very close to *I. involucrata* (no. 27), but differs consistently in the morphology of the calyx and the involucre and in the size of the corolla.

Vouchers: *Barnard* 310 (PRE); *Galpin* 882 (BOL, PRE); *Giess, Volk & Bleissner* 6584 (M, PRE, WIND).

29. *Ipomoea obscura* (L.) Ker Gawl. in Botanical Register 3: t. 239 (1817); Choisy: 370 (1845); Hallier f.: 140 (1893a); Hallier f.: 38 (1899b); Baker & Rendle: 164 (1905–06); Ooststr.: 519 (1940); Ooststr.: 471 (1953); A.Meeuse: 746 (1957a). Iconotype: illustration of *Convolvulus flore minore lacteo* in Dill.: t. 83, fig. 95 (1732), from Djakarta, Java.

Convolvulus obscurus L.: 220 (1762).

var. *obscura*.

Verdo.: 116, t. 24 (1963a); Heine: 349 (1963); Roessler: 15 (1967a); Gonç.: 91 (1987); Gonç.: 98 (1992); Lejoly & Lisowski: 101 (1992); A.Meeuse & W.G.Welman: 48 (1996); Retief & P.P.J.Herman: 385 (1997); W.G.Welman: 72 (1999b).

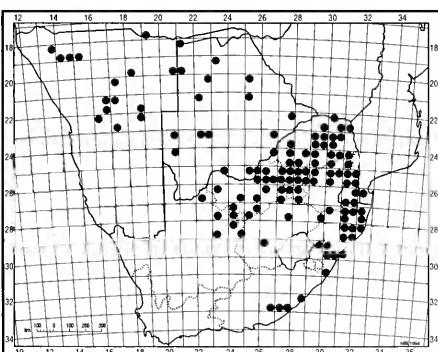
I. fragilis Choisy: 372 (1845). *I. obscura* (L.) Ker Gawl. var. *fragilis* (Choisy) A.Meeuse: t. 1222 (1956d); A.Meeuse: 747 (1957a); J.Adams: t. 123 (1976); A.E.van Wyk & S.Malan: 126 (1988); A.Fabian & Germish.: 334, t. 159b (1997). Type: Cape Province, Maadji Mt, *Burchell* 2362 (G, lecto.; K).

Perennial herb with taproot 500 mm or longer. *Stems* few- to many, mostly unbranched, glabrous to hairy, up to \pm 3 m long, usually prostrate, becoming woody below. *Leaves* usually secund, oblong-cordate to broadly cordate, 30–90 \times 20–75 mm, basal sinus deep, basal lobes

rounded, apex acuminate or apiculate, margin entire to somewhat undulate, often ciliate, usually thinly strigose on both surfaces, green above and paler beneath; petiole hairy, 15–80 mm long. *Inflorescence* cymosely 1- to few-flowered; peduncle 30–80 mm long; bracts minute; pedicels 10–20 mm, minutely verrucose, shortly hairy or glabrous, reflexed and thickened in fruit. *Sepals* subequal, 4–8 mm long, pubescent or glabrous, broadly ovate to ovate-lanceolate, ultimately accrescent and often reflexed. *Corolla* funnel-shaped, pale yellow or white, with or without purple, red or brown centre, 15–25 mm long, limb as much wide, glabrous; midpetaline areas well defined, sometimes thinly hairy outside. *Capsule* ovoid to subglobose, glabrous, 7–12 mm in diameter, pale brown, style base persistent. *Seeds* ovoid, greyish tomentose, 4.5–5.5 mm long. *Flowering time* throughout the year, mostly September to April.

Widespread through tropical Africa to Madagascar, the Mascarene Islands, the Seychelles, also tropical Asia, China and Taiwan to Queensland and Fiji. In southern Africa it is very common from Namibia and Botswana to Swaziland and the summer-rainfall area of South Africa. In forest, bushveld, savanna, grassland, often on sandy soils and also a weed on cultivated ground and along roadsides. Map 57.

All the specimens from southern Africa belong to the var. *obscura* with corolla concol-



MAP 57.—*Ipomoea obscura* var. *obscura*

orous or with a dark centre. The var. *sagittifolia* Verdc. occurs from Zimbabwe to Tanzania. The typical variety is distinguished by its cordate leaves with a deep basal sinus, its broadly ovate to ovate-lanceolate sepals and pale yellow or white, 15–25 mm long corolla.

Vouchers: *Codd* 5295 (PRE); *Culverwell* 1395 (PRE); *De Winter & Marais* 4966 (M, PRE, WIND); *Ward* 2197 (PRE); *Wild* 5047 (K, PRE, SRGH).

30. ***Ipomoea ochracea* (Lindl.) G.Don**, A general system of gardening and botany ... 4: 270 (1837); *Hallier* f.: 140 (1893a); *Baker & Rendle*: 166 (1905–06) pro parte; *Hutch. & Dalziel*: 216 (1931); *A.Meeuse*: t. 1221 (1956e); *Verdc.*: 210 (1958c); *Heine*: 349 (1963); *Lejoly & Lisowski*: 99 (1992). Type: Ghana, a cultivated plant grown from seed collected by *Murray* (CGE, holo.).

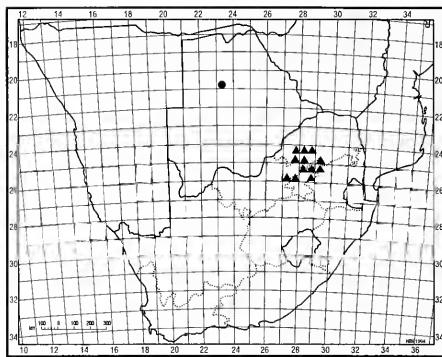
Convolvulus ochraceus Lindl.: t. 1060 (1827a).

var. *ochracea*.

Verdc.: 115 (1963a); Gonç.: 89 (1987); Gonç.: 97 (1992); A.Meeuse & W.G.Welman: 46 (1996).

Perennial herb. Stems slender, prostrate or twining, subglabrous to pubescent, up to 5 m long. Leaves ovate-cordate, up to 100 mm long, apex acuminate, basal sinus broad and shallow, entire to subentire, glabrescent or pubescent above, pubescent below; petiole up to 90 mm long. Inflorescence lax, 1–several-flowered; peduncle up to 55 mm long; pedicels up to 40 mm long; bracteoles minute. Sepals subequal, ovate, acute, glabrous or pubescent, up to 6 mm long. Corolla funnel-shaped, glabrous, 27–40 mm long, bright yellow inside and paler outside or white, always with dark purple or brown centre; midpetaline areas well defined. Capsule globose to conical, tipped by persistent style, 12 mm long, glabrous, straw-coloured. Seeds 4, dark brown, shortly pubescent, 5 mm long. Flowering time throughout the year, mostly June to September.

Found throughout tropical Africa southwards to Ngamiland in Botswana, where it is very



MAP 58.—● *Ipomoea ochracea* var. *ochracea*
▲ *I. transvaalensis*

rare. Grows in woodland, grassland and along river banks, often on sandy soil and in wet places. Map 58.

The above description is of the var. *ochracea*. The var. *curtissii* (House) Stearn, a much stouter plant, comes from Uganda and is apparently naturalised in central America and the Caribbean (see Verdcourt 1963a: 116). The typical variety is distinguished by being a perennial herb with bright yellow flowers with a dark throat, arranged in cymes.

Voucher: *Lugard* 114 (K).

31. ***Ipomoea transvaalensis* A.Meeuse** in *Bothalia* 6: 748 (1957a); *Letty*: 273, t. 136 (1962); *Verdc.*: 122 (1963a); *Gong*: 99 (1987); *A.E.van Wyk & S.Malan*: 200 (1988); *Retief & P.P.J.Herman*: 386 (1997). Type: North-West, Magaliesberg, *Zeyher* 1216 (G-DC, holo.; BOL!, K).

I. convolvuloides *Hallier* f.: 140 (1893a), non *Schinz*. Type as above.

I. transvaalensis A.Meeuse subsp. *orientalis* *Verdc.*: 324 (1958a). Type: Kenya, Tsavo, *Verdcourt* 1199 (EA, holo.; K, PRE).

Perennial with long fusiform tuberous root-stock. Stems annual, herbaceous, suberect or prostrate, up to 1 m long, usually pilose with long silvery hairs (as are petioles, leaves and

peduncles). *Leaves* narrowly deltoid-cordate to broadly cordate-suborbicular, up to 45 mm long, apex obtuse to subacute, mucronulate, entire, base cordate; petiole up to 15 mm long. *Peduncles* 1- or 2-flowered, up to 40 mm long; bracts minute; pedicels up to 15 mm long, sub-clavate in fruit. *Sepals* subequal, 7–8 mm long, ovate-oblong to ovate-lanceolate, apex acute, glabrous to hairy outside, edges hyaline. *Corolla* funnel-shaped, 20–40 mm long, spreading limb as much wide, pink to magenta or white with purple centre; tips of midpetaline areas densely hairy. *Capsule* subglobose, glabrous, ± 8 mm in diameter. *Seeds* ± 5 mm long, densely hairy, purplish brown. *Flowering time* November to March.

Found in Somalia, Kenya, Tanzania and Zimbabwe southwards to the northern part of South Africa in the Northern Province, North-West and Gauteng. Grows scattered in dry bushveld, often on rocky slopes in exposed or shaded places. Map 58.

A variable species, characterised by its inconspicuous bracts and the tufts of hairs at the tips of the midpetaline areas, which are especially conspicuous in the late bud stage. The subsp. *orientalis* is not clearly separable from the rest of the species.

Vouchers: *Burke* 166 (SAM); *Meeuse* 9018 (L, PRE); *Reid* 443 (PRE).

32. *Ipomoea bathycolpos* Hallier f. in *Botanische Jahrbücher* 18: 144 (1893a); Baker & C.H.Wright: 61 (1904); A.Meeuse: 749 (1957a); A.E.van Wyk & S.Malan: 200 (1988); A.Meeuse & W.G.Welman: 48 (1996); Retief & P.P.J.Herman: 383 (1997). Type: North-West, Magaliesberg, Zeyher 1218 (G-DC, holo.; BOL!, LD, SAM!); North-West, Magaliesberg, *Burke* 175 (PRE, SAM, iso.!).

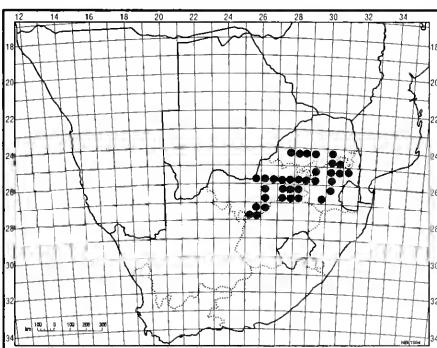
I. bathycolpos Hallier f. var. *sinuatodentata* Hallier f.: 53 (1899a). Type: Mpumalanga, Lydenburg, Wilms 988 (B, holo.); JE, L, PRE!).

Perennial herb with woody taproot, producing annual prostrate stems; scabrid in all parts

except corolla. *Stems* terete or angular, up to ± 2 m long. *Leaves* subcordate, secund, somewhat peltate, cordate to triangular-cordate, 15–55 × 7.5–40.0 mm, apex acute to rounded, usually mucronate with deep basal sinus and oblong basal lobes, upper surface subglabrous, rough, finely net-veined, lower surface similar but with somewhat raised veins; margin thickened, subentire to rarely with large irregular teeth; petiole shorter than or ± as long as leaves. *Peduncles* 1- or 2-flowered, ± as long as leaves; bracteoles minute; pedicels 5–20 mm long, much thickened in fruit. *Sepals* unequal, chartaceous; outer acute to obtuse, ± 12 mm long; inner acute, up to 20 mm long, dark green to brown or purplish green. *Corolla* funnel-shaped with spreading limb, pale mauve to almost white with mauve-magenta centre, 35–70 mm long and limb as wide; midpetaline areas glabrous, conspicuous. *Capsule* globose or depressed-globose, glabrous, ± 15 mm in diameter. *Seeds* ± 10 mm long, tomentose. *Flowering time* October to March. Figure 17.

Endemic mainly in the more or less central regions of South Africa. Map 59.

Specimens with larger leaves with coarse irregular teeth and a narrow basal sinus and usually with larger flowers, were described as the var. *sinuatodentata* Hallier f., but this variety is not worth maintaining because these specimens, which seem to be restricted to the Lydenburg



MAP 59.—*Ipomoea bathycolpos*

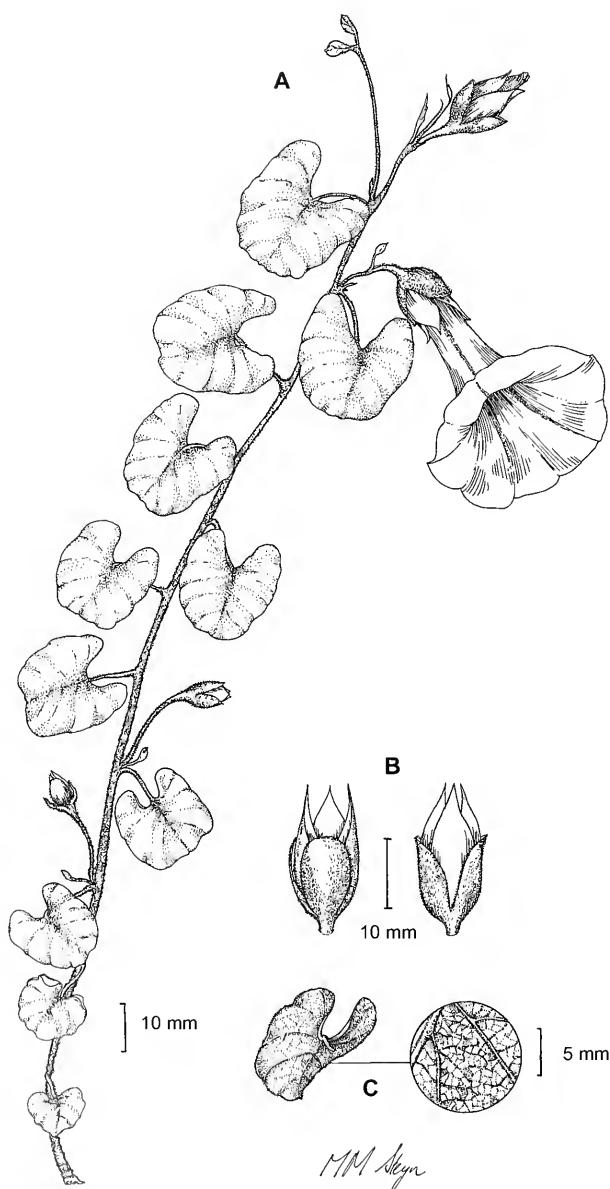


FIGURE 17.—*Ipomoea bathycolpos*: A, flowering stem (*Henrici 1437, PRE*); B, calyx, two views; C, lower leaf surface, with enlargement (*Hanekom 2011, PRE*). Artist: Marietjie Steyn.

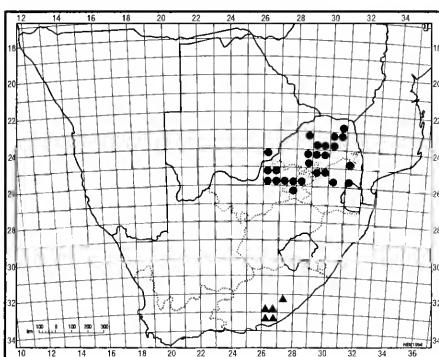
area of Mpumalanga (with a milder winter climate), may simply represent a more luxuriant form. The species is distinguished by being scabrid in all parts except the corolla.

Vouchers: *Marais* 69 (L, PRE); *Meeuse* 9012 (PRE); *Phalatse* 45 (PRE); *Stalmans* 932 (PRE); *Story* 867 (PRE).

33. *Ipomoea papilio* Hallier f. in Bulletin de l'Herbier Boissier 6: 543 (1898a); Rendle: 56 (1901); Baker & C.H.Wright: 63 (1904); Baker & Rendle: 167 (1905–06); A.Meeuse: 750 (1957a); Gonç.: 93 (1987); Gonç.: 99 (1992); Retief & P.P.J.Herman: 385 (1997). Type: Mpumalanga, Barberton, *Galpin* 624 (K, lecto.; PRE!, Z).

Perennial herb. Stems trailing or sometimes also climbing, up to 3 m long, glabrous to hispidulous, scabrid or pubescent like petioles, peduncles and pedicels. Leaves glabrous or subglabrous, broadly cordate or cordate-reniform to cordate-ovate, 20–65 × 20–70 mm, usually entire, upper portion acuminate-triangular, lower portion coarsely few-toothed, basal sinus broad, rounded and shallow; petiole shorter than blade. Peduncles 1-flowered or cymosely 2–7-flowered, 15–90 mm long; bracts minute; pedicels thickening upwards, 5–12 mm long. Sepals unequal, glabrous or somewhat pubescent, accrescent; outer ones oblong to subspatulate, obtuse, 5–6 mm long; inner ones obtuse to subtruncate, 7–9 mm long. Corolla funnel-shaped, limb spreading horizontally, light magenta or purplish, 20–35 mm long, 30–35 mm wide, glabrous; midpetaline areas well defined. Capsule globose or ovoid-conical, glabrous, 6–9 mm in diameter. Seeds brown, 3–4 mm long, shortly pubescent and with dense, short, white or yellowish hairs around hilum. Flowering time throughout the year, mostly November to May.

Found in Zambia, Zimbabwe, Malawi and Mozambique, southwards to Botswana, the northern parts of South Africa and to Swaziland. Grows in bushveld, savanna, grassland, often on rocky slopes, also along roadsides. Map 60.



MAP 60.—● *Ipomoea papilio*
▲ *I. crispa*

Distinguished by its leaves of which the upper portion is acuminate-triangular and entire and the lower portion coarsely few-toothed.

Vouchers: *Acocks* 19173 (PRE); *Clarke* 1749 (PRE); *Codd* 8628 (PRE); *Mithison* 75 (K).

34. *Ipomoea crispa* (Thunb.) Hallier f. in Botanische Jahrbücher 18: 143 (1893a); A.Meeuse: 751 (1957a). Type: Cape of Good Hope, *Thunberg* s.n. (UPS, holo.).

Convolvulus crispus Thunb.: 15 (1818).

I. contorta Choisy: 350 (1845). Type: Cape of Good Hope, *Krebs* s.n. (G-DC, holo.).

I. undulata Baker in Baker & C.H.Wright: 60 (1904). Type: Eastern Cape, Albany Div., Grahamstown, *Burke* s.n. (K, holo.).

Perennial with thick taproot. Stems annual, prostrate, up to at least 750 mm long, bristly hairy when young, pubescent or glabrescent when older. Leaves entire, ovate or oblong, 15–40 mm long, nearly glabrous to thinly bristly hairy, apex rounded to acute with recurved mucro, base cuneate to subcordate, margin distinctly crisped; petiole 5–10 mm long. Peduncles 1-flowered; bracteoles linear or lanceolate, up to ± 10 mm long; pedicels very short; peduncles and pedicels thickening, pedicels lengthening to up to 10 mm in fruit. Sepals subequal, oblong or lanceolate-oblong,

hairy outside, 8–13 mm long, in fruit hardened and glabrescent, enlarged to 14–17 mm long. *Corolla* funnel-shaped, purple or magenta, 30–50 mm long, glabrous to silky outside on midpetaline areas. *Capsule* globose, apiculate, 8–9 mm in diameter, light brown, glabrous. *Seeds* ± 5 mm long, densely hairy. *Flowering time* December to May.

Ipomoea crispa is endemic to the Eastern Cape. Map 60.

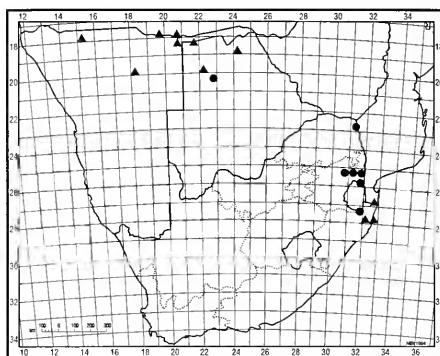
This species can be distinguished from related ones, such as *I. pellita* (no. 10) and *I. oblongata* (no. 24), by the shorter sepals, smaller crisped leaves with a recurved apical mucro, the slender 5–10 mm long petioles and the hairy seeds.

Vouchers: Brink 655 (GRA, PRE); Daly 665 (GRA, PRE); Dyer 2328 (GRA, PRE).

35. *Ipomoea lapathifolia* Hallier f. in Botanische Jahrbücher 18: 142 (1893a); Baker & Rendle: 168 (1905–06); A.Meeuse: t. 1209 (1956f); A.Meeuse: 752 (1957a); Verdc.: 8 (1961b); Verdc.: 118 (1963a); Roessler: 15 (1967a); Verdc.: 166 (1978); Gonç.: 94 (1987); Gonç.: 100 (1992); Lejoly & Lisowski: 103 (1992); Retief & P.P.J.Herman: 384 (1997). Type: Mozambique, Quelimane, Stuhlmann 109 (not found at HBG).

I. dinteri Schulze-Menz: 457 (1941). Type: Namibia, Tsumeb-Nossib, Dinter 7427 (B, holo, †).

Perennial herb with a thin taproot. *Stems* several, twining or prostrate, up to 3 m long, glabrous to hairy, ridged. *Leaves* slightly fleshy, linear to broadly-ovate, 40–100 × 25–70 mm, apex mucronate, obtuse to subacute, base rounded to truncate, green above, paler below, glabrous to thinly hairy, margin entire or ± sinuous; petiole 10–40 mm long. *Inflorescences* closely umbellate cymes, 3–12-flowered; peduncle 10–150 mm long; bracteoles 1–3 mm long, early deciduous; pedicels up to 20 mm long. *Sepals* unequal, subcoriaceous; outer ones triangular to oblong, 6–7 mm long, finely muriculate or verrucose on back; inner ones oblong to ovate, 7–8 mm long, smooth, with a



MAP 61.—● *Ipomoea lapathifolia*
▲ *I. aquatica*

broad, hyaline membranous edge; all somewhat accrescent and glabrous. *Corolla* glabrous; tube cylindrical, mauve with fine purple striations outside, magenta inside except for a white zone below insertion of stamens, 20–40 mm long; limb funnel-shaped, pure white with yellowish green, well-defined midpetaline areas, 25–35 mm wide, shallowly 5-lobed. *Capsule* globose, ± 8 mm in diameter, apiculate, glabrous, brownish. *Seeds* 4, dark brown, sub-glabrous to finely adpressed puberulous, 4–5 mm long. *Flowering time* November to April.

From Tanzania, Uganda, Democratic Republic of the Congo, Zambia, Malawi, Zimbabwe and Mozambique to northern Botswana, Swaziland, the Northern Province and Mpumalanga. Grows in wet areas in woodland, savanna, grassland, also along roadsides and in disturbed places. Flowers open at night. Map 61.

Distinguished by its slightly fleshy leaves, closely umbellate cymes and corollas with long, cylindrical, mauve/magenta tubes. The above description is of the var. *lapathifolia*. The var. *bussei* (Pilg.) Verdc., with irregularly and deeply sinuate-dentate leaves and 25 mm long corolla, occurs in Tanzania.

Vouchers: Codd 7791 (PRE); Compton 29424 (PRE); Curson 410 (PRE).

36. *Ipomoea aquatica* Forssk., Flora aegyptiaco-arabica: 44 (1775); Baker & Rendle: 170 (1905–06); Ooststr.: 528 (1940); Ooststr.: 473 (1953); A.Meeuse: 753 (1957a); Verde.: 120 (1963a); Heine: 349 (1963); Roessler: 13 (1967a); Gonç.: 97 (1987); Gonç.: 103 (1992); Lejoly & Lisowski: 110 (1992). Type: Yemen, Zebid, *Forsskal s.n.* (C, holo.; BM).

I. reptans sensu Roem. & Schult.: 244 (1819) et auctt. mult., non *Convolvulus reptans* L.

I. natans Dinter & Suess.: 112 (1952). Type: Namibia, Niengana, Okavango, *Dinter 7236* (BOL, PRE!).

Glabrous perennial or sometimes annual herb. *Stems* many from a woody base, thick, semisucculent, terete or striate, hollow or spongy, rooting at nodes, trailing on mud or floating on water, up to 3 m long, sometimes hairy at nodes. *Leaves* very variable, ovate to triangular or linear, 30–150 × 10–90 mm, apex acute to obtuse, base truncate, cordate to hastate and auriculate, margin entire or dentate; petiole thick, 30–250 mm long. *Peduncles* axillary, 10–140 mm long, cymosely 1- to few-flowered; pedicels 20–65 mm long; bracts narrow, acute, 1.5–2 mm long. *Sepals* coriaceous with thin, pale margins, sometimes verrucose, subequal, ovate-oblong to ovate-elliptic, obtuse or acute, 6–12 mm long. *Corolla* funnel-shaped, purple, pink or white, often with a purple eye, rarely entirely white, 25–75 mm long, limb 45–50 mm in diameter, narrow tube somewhat constricted at place of insertion of filaments. *Capsule* ovoid, 8–10 mm long. *Seeds* densely pubescent. *Flowering time* October to June.

Circumtropical. Grows in swampy places, on muddy river banks, at pond margins, in shallow water, often in seasonal swamps in semidesert country, also in rice-fields. Found in northern Namibia, northern Botswana and northern KwaZulu-Natal. Map 61.

Distinguished by its thick, hollow or spongy stems which root at the nodes and leaves that are never elliptic or suborbicular, with emarginate or bilobed tips.

In Asia and some other tropical regions, it is collected and even cultivated as a vegetable, the

leaves eaten raw or boiled. It is easily propagated by cuttings. Sinha & Sharma (1992) report a chromosome count of $2n = 30$. Ugborogho & Ogunwenmo (1995) studied the biology of this species in Nigeria.

Vouchers: *Schoenfelder 40* (PRE); *Smith 1152* (PRE, SRGH); *Valhmeijer & Toelken 986* (PRE).

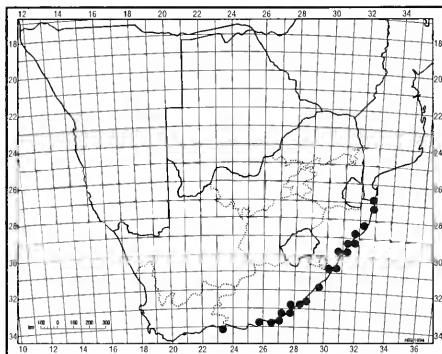
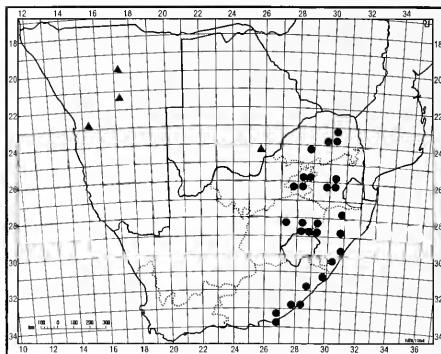
37. *Ipomoea pes-caprae* (L.) R.Br. in J.K.Tuckey, Narrative of an expedition to explore the river Zaïre: 477 (1818); Choisy: 349 (1845); Hallier f.: 145 (1893a); Hutch. & Dalziel: 215 (1931). Type: India, specimen 218.59 (LINN, lecto.).

Convolvulus pes-caprae L.: 159 (1753).

subsp. *brasiliensis* (L.) Ooststr. in Blumea 3: 533 (1940); Ooststr.: 475 (1953); A.Meeuse: 754 (1957a); Verde.: 121 (1963a); Heine: 347 (1963); Gonç.: 98 (1987); Gonç.: 105 (1992); Lejoly & Lisowski: 112 (1992); Gonç.: 32 (1996). Iconotype: illustration of *Convolvulus marinus cartharticus* ... in Plum.: 89, t. 104 (1693), from Brazil.

C. brasiliensis L.: 159 (1753).

Glabrous perennial herb with a thick, woody base. *Stems* creeping, stout, hollow, laticiferous, 5–30 m long, rooting at nodes, often forming tangled mats. *Leaves* secund, subcoriaceous, suborbicular to elliptic, 30–100 × 30–105 mm, entire, apex usually deeply emarginate to bilobed, rarely rounded, base rounded, cuneate or cordate, midrib below with 2 glands at leaf base; petiole purplish, up to 170 mm long. *Peduncles* secund, 1- or cymosely many-flowered, 30–160 mm long; bracts or bracteoles 3.0–3.5 mm long, pedicels up to 45 mm long in fruit. *Sepals* subequal to unequal, very concave, apex obtuse; outer ones ovate to elliptic, 5–8 mm long; inner ones broader to orbicular, 7–12 mm long. *Corolla* funnel-shaped, 30–55 mm long, pink, magenta or purple with darker centre, rarely entirely white. *Capsule* subglobose or ovoid, 12–18 mm in diameter. *Seeds* 6–10 mm long, blackish brown, tomentose-villous. *Flowering time* December to May, mostly January and February.

MAP 62.—*Ipomoea pes-caprae* subsp. *brasiliensis*MAP 63.—● *Ipomoea simplex*
▲ *I. welwitschii*

Pantropical species. In southern Africa it occurs along the eastern coast from Knysna in the Western Cape to KwaZulu-Natal and further north. Characteristic plant of sandy seashores and estuaries above the high-tide mark, more rarely inland along lake shores and even roadsides. Often forming almost pure stands of appreciable size. Map 62.

Distinguished by its thick, hollow, laticiferous stems which root at the nodes and elliptic to suborbicular leaves with emarginate to bilobed tips. The African (and American) material belongs to the subsp. *brasiliensis* (L.) Ooststr. The typical subspecies with deeply bilobed leaves occurs in Arabia and tropical Asia. Keeler & Kaul (1979: 946) studied the petiolar nectaries in this species.

Vouchers: Johnson 1112 (PRE); Strey 8074 (NH, PRE); Watmough 500 (PRE, SRGH).

38. ***Ipomoea simplex* Thunb.**, Prodromus plantarum capensis ... 1: 36 (1794); J.M. Wood & M.S. Evans: 15 (1898); Baker & C.H. Wright: 48 (1904); A. Meeuse: 755 (1957a); A.E. van Wyk & S. Malan: 126 (1988); Retief & P.P.J. Herman: 386 (1997). Type: Eastern Cape, Uitenhage, Thunberg s.n. (U-Thunb., holo.).

Convolvulus plantagineus Choisy: 405 (1845). *I. plantaginea* (Choisy) Hallier f.: 147 (1893a). Type: Eastern Cape, Zuurberg, Drège s.n. (K, iso.).

Glabrous perennial with obovoid to fusiform tuberous rootstock, 40–100 mm long. Stems erect, woody, gnarled and rough, usually partly underground (up to 90 mm), above ground up to ± 100 mm long, angular and furrowed. Leaves usually close together, linear to lanceolate, 30–100 mm long, apex acute or acuminate, base long-tapering or rounded, mostly subsessile, entire or with a few pinnate lobes up to 15 mm long. Flowers solitary, axillary; peduncles and pedicels short; bracteoles almost linear. Sepals subequal, oblong-lanceolate to ovate-lanceolate, 9–15 mm long. Corolla funnel-shaped, white, 20–35 mm long, 20–25 mm wide, shallowly lobed. Capsule subglobose, glabrous, 7–9 mm in diameter. Seeds 4–5 mm long, dark brown, tomentose. Flowering time September to April.

Endemic to the central and eastern parts of southern Africa. Most often in grassland. Map 63.

Ipomoea simplex is close to both *I. bolusiana* (no. 40) and *I. welwitschii* (no. 39), but can be recognised by its smaller, white flowers and simple leaves.

Vouchers: Acocks 12057 (PRE); Moll 2369a (NH, PRE); Retief 86 (PRE); Story 882 (PRE).

39. ***Ipomoea welwitschii* Vatke ex Hallier f.** in Botanische Jahrbücher 18: 146 (1893a); Hiern: 739 (1898); Baker & Rendle: 174

(1905–06); A.Meeuse: 756 (1957a); Verdc.: 9 (1961b); Verdc.: 119 (1963a); Roessler: 17 (1967a); Gonç.: 95 (1987); Gonç.: 101 (1992); Lejoly & Lisowski: 104 (1992). Type: Namibia, Damaraland, Okahandja, *Höpfner* 39 (JE, lecto.!).

I. inamoena Pilg.: 221 (1910). Type: Namibia, Aitsas, Omahehe, *Dinter* 836 (SAM, iso.!).

I. inamoena Pilg. var. *trisepta* Dinter: 36 (1914). Type: Namibia, Gaub, *Dinter* 2429 (SAM; PRE, isosyn.!); Namibia, Okatjimane, *Dinter* 3302 (SAM; PRE, isosyn.!).

Perennial with a large woody rootstock or globose tuber with a dark bark. *Stems* several, annual, suberect to prostrate, stiff, rather stout, glabrous or minutely hirsute, up to 500 mm long. *Leaves* usually secund, often falcate, linear to ovate-lanceolate, 40–120 × 20–40 mm, apex acute to apiculate, also bilobed, base cuneate to rounded, glabrous or with short bristles on nerves and margins, conspicuously nerved; petiole 5–10 mm long. (Leaves also deeply incised or trisected, leaf segments narrower than 10 mm.) *Peduncles* 1–3-flowered, axillary, glabrous, 10–50 mm long; bracts minute; pedicels subclavate, up to ± 12 mm long. *Calyx* subglabrous, sepals subequal, ovate-oblong to ovate-lanceolate, 8–12 mm long. *Corolla* funnel-shaped, glabrous, 50–80 mm long, pale pink or pale mauve, tube darker inside, limb 5-angled; midpetaline areas distinct, ending in mucronate-aristate points. *Capsule* subglobose, apiculate, glabrous, 10–12 mm in diameter. *Seeds* ± 4 mm long, brown, glabrous with a basal tuft of hairs near hilum. *Flowering time* November to March.

From the Sudan southwards to Namibia and Botswana. Grows in bushveld, savanna and grassland, often on sandy soil. Sometimes flowers profusely when almost leafless. Map 63.

A variable but rare species allied to *I. simplex* (no. 38) and *I. bolusiana* (no. 40), but usually pubescent in some parts and with a different leaf morphology.

Vouchers: *Codd* 8922 (K, PRE, SRGH); *Dinter* 5258 (BOL, PRE, SAM).

40. ***Ipomoea bolusiana* Schinz**, Verhandlungen des Botanischen Vereins der Provinz Brandenburg, Berlin 30: 271 (1888); Hallier f.: 147 (1893a); Hallier f.: 53 (1899b); Baker & Rendle: 175 (1905–06); A.Meeuse: 758 (1957a); Roessler: 13 (1967a); J.Adams: t. 122 (1976); Gonç.: 100, t. 24 (1987); A.E.van Wyk & S.Malan: 200 (1988); Gonç.: 106, t. 23 (1992); Lejoly & Lisowski: 106, t. 15 (1992); A.Meeuse & W.G.Welman: 48 (1996); A.Fabian & Germish.: 334, t. 159c (1997); Retief & P.P.J.Herman: 383 (1997); V.Roodt: 63 (1998). Type: Namibia, *Schinz* 101 (Z, holo.; GRA!).

I. angustisecta Engl.: 245 (1888). Type: Northern Cape, Kimberley, Wienand's Farm, *Marloth* 777 (PRE, iso.!).

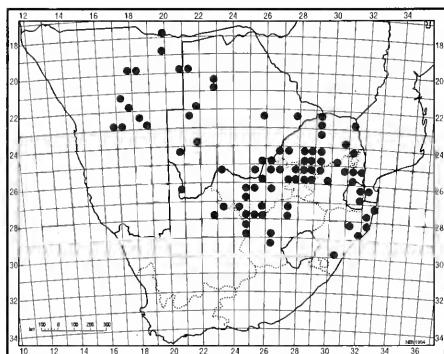
I. mesenterioides Hallier f.: 544 (1898a). Type: Northern Province, Potgietersrus, Klippan, *Rehmann* 5267 (Z, holo.!).

I. praetermissa Rendle: 56 (1901). Type: Transvaal (?), *Zeyher* 1214 (BM, holo.).

I. bolusiana Schinz var. *pinnatipartita* Verdc.: 118 (1967). Type: Gauteng, Pretoria, Petronella, *Mogg* & *Pedro* 673 (LMJ, holo.).

Glabrous perennial. *Root* tuberous, mostly subglobose, up to 130 mm in diameter. *Stems* one or several, erect or prostrate, woody at base, erect stems up to 300 mm long, prostrate ones up to 3 m or more. *Leaves* either palmately 3–9-sect (mainly on creeping stems) with segments 20–70 × 0.5–3.0 mm, or simple, linear to bilobed, 40–150 × 2–7 mm, sometimes pinnate, if three, then terminal segments partly fused to form a common rhachis; petiole of dissected leaves up to ± 20 mm long, of simple leaves sometimes inconspicuous. *Peduncles* 1-flowered, usually very short; bracteoles often deciduous; pedicels short, thickened. *Sepals* lanceolate to elliptic, acute or acuminate, equal or unequal, 7–20 mm long. *Corolla* funnel-shaped, 40–70 mm long, 40–60 mm wide, usually bright magenta-pink, lighter outside and darker in centre and on midpetaline areas. *Capsule* subglobose-conical, 10–12 mm long and in diameter, apex often depressed, apiculate by style base. *Seeds* 4, 5–7 mm long, covered with long, shiny, fawn hairs. *Flowering time* August to April.

Distributed from Tanzania, Zambia, Angola, Zimbabwe, Mozambique, Namibia and Botswana.

MAP 64.—*Ipomoea bolusiana*

na to Swaziland and the central and eastern parts of South Africa. Its occurrence in Madagascar (Meeuse 1957a: 758) could not be verified. Found in bushveld, savanna and grassland, on rocky and sandy soils. Map 64.

This common and variable species belongs to the group of *I. simplex* (no. 38) and *I. welwitschii* (no. 39). It differs from the former by its large pink to purple corolla and from the latter by its leaf morphology and glabrous vegetative parts. It is possible that these three species form one large, variable aggregate species.

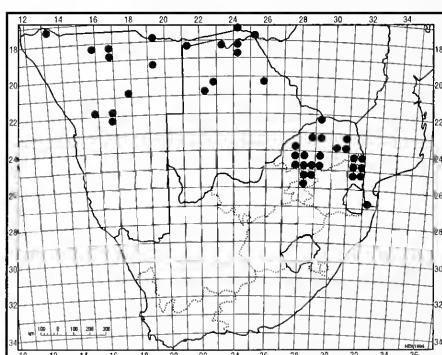
Vouchers: *De Winter* 3791 (M, PRE, WIND); *Drummond* 8841 (PRE, SRGH); *Hitchins* 619 (PRE); *Leistner* 577 (PRE); *Reid* 446 (PRE).

41. ***Ipomoea coptica* (L.) Roth ex Roem. & Schult.**, *Systema vegetabilium ... 4: 208* (1819); Roth: 110 (1821); Choisy: 384 (1845); Hallier f.: 147 (1893a); Hallier f.: 45 (1899a); Ooststr.: 544 (1940); Ooststr.: 479 (1953); A. Meeuse: t. 1217A (1956g); A. Meeuse: 760 (1957a); Heine: 350 (1963); Verdc.: 128 (1963a); Roessler: 14 (1967a); Gonç.: 108 (1987); Gonç.: 112 (1992); Lejoly & Lisowski: 118 (1992); Gonç.: 36 (1996); Retief & P.P.J. Herman: 384 (1997); V. Roodt: 65 (1998). Type: Orient, specimen 218.32 (LINN, lecto., PRE, photo of lecto.!).

Convolvulus copticus L.: 559 (1771).

Glabrous annual herb. *Stems* several from base, prostrate or climbing, up to 1.5 m long, 4-angled, striate, often finely muriculate as are peduncles and petioles. *Leaves* pseudostipulate, orbicular to ovate in outline, 20–80 mm wide, digitately compound with 5–7 linear to ovate, coarsely serrate to pinnatisect segments; middle lobe the longest, all lobes ± petiolated, slightly fleshy, drying thin and papery; petiole 25–50 mm long; pseudostipules resembling leaves, up to 20 mm wide. *Inflorescence* axillary; peduncle cymosely 1–3-flowered, 10–40 mm long, longer in fruit; bracteoles usually minute; pedicels bent downwards in fruit, 4–10 mm long. *Sepals* subequal, oblong or elliptic, muriculate, 4–5 mm long, larger in fruit. *Corolla* funnel-shaped, 10–15 mm long, off-white tinged with pale mauve on tube outside, limb 5-angled, 10–12 mm wide. *Capsule* depressed-globose, brown, 6–7 mm in diameter, minutely apiculate, 3-locular. *Seeds* 6, 2–3 mm long, 3-angled, dark brown, greyish silky tomentose except on hilum. *Flowering time* December to June.

Found in northern Namibia, Botswana and the northern parts of South Africa in the Northern Province, Gauteng, Mpumalanga and northern KwaZulu-Natal; also in tropical Africa, the Middle East, tropical Asia and northern Australia. Grows in bushveld, savanna and grassland, can become a weed of roadsides, cultivated and waste areas. Map 65.

MAP 65.—*Ipomoea coptica*

Most specimens from southern Africa agree with the var. *coptica*, but a few can be regarded as var. *acuta* Choisy with 'leaf segments linear, finely toothed, teeth narrow and very acute; bracts large, 15 mm long, pinnatifid' (see Gonçalves 1987: 108). There are intermediates, and *I. coptica* should perhaps not be divided into varieties. *I. ticcopa* Verdc. (1963a: 129), recorded from Kenya, Tanzania and Mozambique and possibly extending into KwaZulu-Natal, probably is no more than a form of the rather polymorphic *I. coptica*. The species is recognised by its compound leaves with serrate to pinnatisect segments, its pseudostipules resembling leaves, its muriculate sepals and whitish corolla.

Used medicinally in Egypt (Watt & Breyer-Brandwijk 1962: 308).

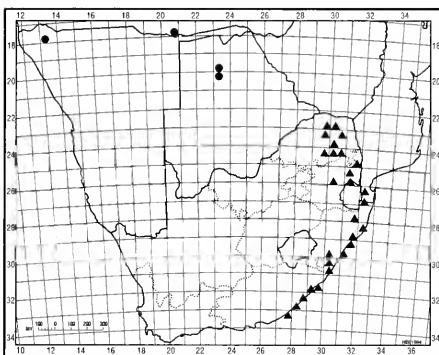
Vouchers: Giess, Volk & Bleissner 6636 (M, PRE, WIND); Smith 3021 (PRE, SRGH); Strey 8178 (NH, PRE); Welman 514 (PRE).

42. *Ipomoea tuberculata* Ker Gawl. in Botanical Register 1: t. 86 (Feb. 1816); Verdc.: 123 (1963a); Roessler: 17 (1967a); Gonç.: 102 (1987); Gonç.: 108 (1992). Type: plant cultivated in England from seed from Calcutta, no specimen traced; the plate in Botanical Register can serve as iconotype.

I. dasysperma J.Jacq.: 132, t. 89 (Aug. 1816); A.Meeuse: 760 (1967a). Type: no specimen traced. Jacquin's plate can serve as iconotype.

I. calcarata N.E.Br. in Baker & Rendle: 180 (1905–06). Type: Botswana, Ngamiland, Kwebe, Lugard 182 (K, lecto.).

Glabrous annual herb. Stems climbing, up to 2 m long, smooth or tuberculate. Leaves broadly cordate-ovate in outline, up to 120 mm wide, binternately or digitately 5–9-lobed; lobes up to 80 mm long, linear to elliptic, apex acute to acuminate; petiole 20–60 mm long, often pseudostipulate. Peduncles 10–80 mm long, 1–3-flowered; bracteoles minute; pedicels 5–30 mm long, subclavate. Sepals oblong to elliptic, apex obtuse, smooth or verruculose, 8–10 mm long; outer ones sometimes shorter than inner ones,



MAP 66.—● *Ipomoea tuberculata*
▲ *I. carica*

gibbous and 1- or 2-tuberculate at base. Corolla salver- to funnel-shaped, 30–60 mm long, tube pale mauve outside, darker mauve or bright magenta inside; limb up to 60 mm wide, bright yellow, paler outside; midpetaline areas distinct, somewhat greenish. Capsule subglobose, glabrous, ± 10 mm in diameter. Seeds subglobose-trigonous, ± 6 mm long, brown, with adpressed pubescence, often also with long cottony hairs on angles. Flowering time February to May.

From Somalia and Ethiopia through the drier parts of eastern Africa to northern Namibia and northern Botswana, extending to Sri Lanka and India; doubtfully reported from China. Grows in mixed scrub, woodland and in riverine forest. Map 66.

The above description refers to the var. *tuberculata*, with a mostly 40–50 mm long corolla. The var. *odontosepala* (Baker) Verdc., with the corolla up to 100 mm long, occurs in Ethiopia, Tanzania and Zambia. The species is recognised by its binternately pedate 5–9-lobed leaves, its pseudostipules, its 8–10 mm long saccate outer sepals and yellow corolla with mauve tubes.

Vouchers: De Winter & Marais 4611 (M, PRE, WIND); Lambrecht 505 (K, PRE, SRGH).

43. *Ipomoea cairica* (L.) Sweet, Hortus britanicus, 1st edn: 287 (1827); Hallier f.: 148 (1893a); Hutch. & Dalziel: 216 (1931); Ooststr.: 542 (1940); Ooststr.: 479 (1953); A.Meeuse: 761 (1957a); Verdc.: 125 (1963a); Heine: 351 (1963); Gonç.: 105, t. 26 (1987); Gonç.: 110, t. 24 (1992); Lejoly & Lisowski: 115, t. 16 (1992); Gonç.: 34, t. 9 (1996); Retief & P.P.J.Herman: 383 (1997). Iconotype: illustration of *Convolvulus aegyptius* in J.Vesling: 75, fig. s.n. (1638).

Convolvulus cairicus L.: 922 (1759b).

Glabrous perennial with tuberous root. *Stems* up to 1.8 m long, smooth or tuberculate, twining or rarely prostrate. *Leaves* ovate to orbicular in outline, 30–100 mm wide, deeply palmately dissected into 5–7 lanceolate to ovate-elliptic, mucronulate segments; basal lobes often bifid in 5-lobed leaves; petiole 20–60 mm long, usually with pseudostipules resembling leaves but smaller. *Peduncles* 1- to few-flowered, 5–70 mm long; bracteoles minute; pedicels 12–20 mm long. *Sepals* subequal, subovate, mucronulate, green with pellucid dots and pale scarious margins; often minutely tuberculate outside, 4–7 mm long. *Corolla* broadly funnel-shaped, 30–60 mm long, 40–60 mm wide, tube contracted near base, mauve, paler outside and with darker magenta centre (rarely entirely white). *Capsule* subglobose, 8–12 mm in diameter. *Seeds* 5–6 mm long, blackish, subglobose, tomentose and with white up to 9 mm long hairs along edges. *Flowering time* throughout the year.

Indigenous throughout Africa, also from the eastern Mediterranean region through Asia to Taiwan; naturalised elsewhere as an escape from cultivation. In southern Africa it is recorded from Botswana (Gonçalves 1987: 105), Swaziland and the northern and eastern parts of South Africa. Found in forest, bushveld, wet grassland, at edges of rivers and lakes, also along roadsides, waste places and cultivated ground. Map 66.

Used medicinally (Watt & Breyer-Brandwijk 1962: 308). Often cultivated (as Messina creeper), but can also be a weed.

All specimens from southern Africa belong to the var. *cairica*. It can be distinguished by its pseudostipulate, palmately partite leaves usually with five segments and its 30–60 mm long mauve corolla. The var. *indica* Hallier f. is intermediate between the var. *cairica* and *I. hochstetteri* (no. 44). It has a 23–30 mm long corolla and occurs in Kenya, Somalia and India. Keeler & Kaul (1979: 946) studied the petiolar nectaries in this species. For notes on the synonymy, see Austin & Bianchini (1998).

Vouchers: *Culverwell* II34 (PRE); *Moll* 4995 (NH, PRE); *Netshungani* 649 (PRE); *Ward* 8705 (PRE, UDW).

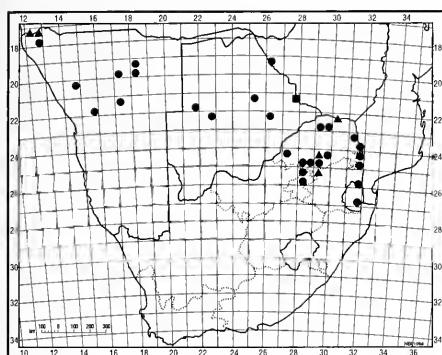
44. *Ipomoea hochstetteri* House, Annals of the New York Academy of Sciences 18: 223 (1908) (sphalm. 'hochsteri'); A.Meeuse: t. 1189 (1955d); A.Meeuse: 762 (1957a); Verdc.: 126 (1963a); Roessler: 14 (1967a); Gonç.: 105 (1987); A.Fabian & Germish.: 334, t. 159f (1997); Retief & P.P.J.Herman: 384 (1997). Type: Ethiopia, without locality, *Schimper* 321 (G, K, isolecto.).

I. quinquefolia Hochst. ex Hallier f.: 147 (1893a), nom illegit. non L. nec Griseb. Type as above.

I. quinquefolia Hochst. ex Hallier f. var. *purpurea* Hallier f.: 546 (1898a). Type: Namibia, Ovamboland, between Ondonga and Ukuambi, *Rautanen* 177, 179, 192, 193 (Z, syn.).

I. kwebensis N.E.Br.: 123 (1909). Type: as for *I. quinquefolia* var. *purpurea*.

Glabrous, herbaceous annual. *Stems* many, twining or prostrate, up to several metres long, with long internodes, smooth or finely striate. *Leaves* circular in outline, palmately 5-lobed, 40–120 mm wide; lobes oblong to elliptic, apex obtuse to acuminate, mucronate, attenuate at both ends, somewhat succulent, drying papery, entire or one or both of basal lobes with a lateral lobule, central lobe up to 70 × 30 mm, lateral ones smaller; petiole pseudostipulate, up to 70 mm long. *Inflorescence* cymosely 1-Several-flowered; peduncle thick, 20–50 mm long; bracteoles minute, deciduous; pedicels stoutish, subclavate, 5–30 mm long. *Calyx* muriculate, 7–8 mm long; sepals subequal, ovate-oblong or lanceolate, often reflexed in fruit. *Corolla* pur-

MAP 67.—● *Ipomoea hochstetteri*

- ▲ *I. tenuipes*
- *I. fanshawei*

plish mauve or white, funnel-shaped, 15–25 mm long, limb lobed and crinkly, 25 mm wide; midpetaline areas well defined. *Capsule* enclosed by persistent calyx, globose, shortly apiculate, 8–9 mm in diameter. *Seeds* depressed-ovoid, 4.5 mm long, brown, pubescent, often with long hairs on edges. *Flowering time* December to May.

Occurs from Ethiopia through Kenya, Tanzania, Uganda, Malawi, Zambia, Zimbabwe, Namibia and Botswana to Swaziland and the northern parts of South Africa. Its occurrence in India could not be confirmed. Grows in grassland, often on swampy or sandy soil, also as a weed along roadsides, on waste land and in cultivated fields. Map 67.

Distinguished by its pseudostipulate palmately partite leaves, 15–25 mm long corolla and rather thick peduncles.

The leaves are used as a vegetable (Watt & Breyer-Brandwijk 1962: 308).

Vouchers: *Codd & Dyer* 7756 (PRE); *De Winter & Leistner* 5514 (M, PRE, WIND); *Kemp* 1158 (PRE); *Ngoni* 479 (PRE, SRGH).

45. ***Ipomoea tenuipes* Verdc.** in Kew Bulletin 15: 12 (1961b); Verdc.: 127 (1963a); Roess-

ler: 17 (1967a); Gonç.: 107 (1987); Gonç.: 112 (1992); Retief & P.P.J. Herman: 386 (1997). Type: Tanzania, Masai District, near Kwa Kuchinja, *Milne-Redhead & Taylor* 11194 (K, holo.; EA).

Convolvulus heptaphyllus Rottler & Willd.: 196 (1803), pro parte (epithet not available in *Ipomoea*). Type: India, Madras, Marmelon, *Rottler in Herb. Willdenow* 3721 (B, holo.†; K, iso.).

I. heptaphylla sensu A. Meeuse: 764 (1957a), non (Roxb.) Voigt.

Glabrous, herbaceous, annual or perennial twiner. *Stems* up to at least 1 m long. *Leaves* pseudostipulate (pseudostipules resembling leaves but much smaller), orbicular in outline, 20–60 mm in diameter, deeply palmately 5-lobed, outer lobes usually bilobed; lobes elliptic to lanceolate, entire, apex obtuse, apiculate, base narrowed; petiole 40–50 mm long. *Flowers* axillary, solitary or cymosely 2- or 3-flowered; peduncles 40–50 mm long, very slender; bracteoles minute; pedicel 17 mm long, ± clavate. *Sepals* subequal, edges membranous, elliptic to orbicular, apex obtuse or rounded, mucronulate, 2–5 mm long, often tuberculate. *Corolla* funnel-shaped with subcylindric tube, purplish mauve, 10–18 mm long and spreading limb as wide. *Capsule* subglobose, glabrous, 8–10 mm long. *Seeds* subglobose, 5–6 mm long, brown, pubescent and with 5–10 mm long white hairs on edges. *Flowering time* March to July.

Occurs in tropical Africa, India and possibly the West Indies. In southern Africa it is rare and reaches northern Namibia, northern Botswana (Gonçalves 1987: 107), the Northern Province and Mpumalanga. Grows in bushveld, savanna, grassland, riverine forest and also cultivated ground, usually on moist ground. Map 67.

Distinguished by its palmately partite leaves, 10–18 mm long purplish mauve flowers and thin peduncle. For full synonymy, see Verdcourt (1963a: 127).

Vouchers: *De Winter & Leistner* 5777 (M, PRE, WIND); *Strey & Schlieben* 8650 (PRE).

46. *Ipomoea fanshawei* Verdc. in Kirkia 6: 119 (1967); Gonç.: 102, t. 25 (1987); A.Meeuse & W.G.Welman: 46 (1996). Type: Zambia, Machili, *Fanshawe* 6001 (K, holo.; SRGH).

Glabrous perennial herb with woody, tuberous rootstock. *Stems* prostrate, glutinous. *Leaves* rhomboid-lanceolate in outline, 30–90 × 5–40 mm, apex acute or acuminate, base cuneate, margin entire to lobed; lobes linear to triangular, up to 20 mm long, leathery, punctate, 6–8-palmatifid; nerves prominent on lower surface; petiole 8–55 mm long. *Flowers* solitary, axillary; peduncles 37–55 mm long; pedicel 5–12 mm long; bracts 5 mm long. *Sepals* lanceolate, 15–18 mm long, membranous, accrescent in fruit. *Corolla* funnel-shaped, 60 mm long, pale purple or mauve. *Capsule* globose, coriaceous. *Seeds* ovoid, covered with long, shiny, fawn hairs. *Flowering time* January.

Fairly rare, endemic to southern Zambia and northeastern Botswana. Found in bushveld and open sandveld. Map 67.

Distinguished by its rhomboid-lanceolate leaves with entire to lobed margin and its 60 mm long, pale purple or mauve corolla.

Voucher: *Leach & Noel* 43 (SRGH).

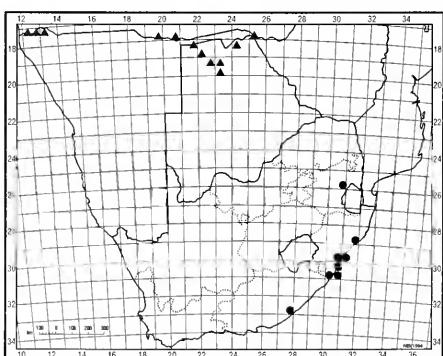
47. **Ipomoea alba* L., Species plantarum, 1st edn: 161 (1753); Hallier f.: 25 (1910); Ooststr.: 547 (1940); Ooststr.: 480 (1953); A.Meeuse: 765 (1957a); Heine: 346 (1963); Verdc.: 130, t. 22 (1963a); Gonç.: 110, t. 27 (1987); Gonç.: 115, t. 25 (1992); Lejoly & Lisowski: 64, t. 7 (1992); Retief & P.P.J.Herman: 383 (1997); W.G.Welman: 70, t. s.n. (1999c). Iconotype: illustration of *Convolvulus malabaricus flore amplio...* in Rheede: 103, t. 50 (1692), from Malabar, India.

Herbaceous annual or perennial, usually glabrous. *Stems* prostrate or twining, laticiferous, smooth or sometimes muriculate, up to 5 m long. *Leaves* oblong to orbicular in outline, 60–120 × 50–160 mm, entire or 3-lobed, apex

acuminate, mucronulate, base cordate, basal auricles rounded to angular, margin entire; petiole 50–200 mm long. *Inflorescence* axillary, 1–several-flowered; peduncle stout, 10–240 mm long; bracteoles small; pedicels up to 30 mm long and very thick in fruit. *Sepals* unequal, elliptic; outer ones 5–10 mm long with a long awn-like appendage; inner ones 8–15 mm long, shortly mucronulate. *Corolla* salver-shaped, opening at night, fragrant, white, greenish cream-coloured below; tube 70–150 mm long, cylindrical; limb 110–160 mm wide. *Capsule* ovoid, mucronate, glabrous, 25–30 mm long. *Seeds* 4, ovoid, 10–12 mm long, white, brown or black, glabrous, smooth. *Flowering time* throughout the year, mostly January and February.

Probably originally tropical American, but now circumtropical as an escape and also cultivated as an ornamental. Found in grassland, on river banks, along roadsides and in waste places. In southern Africa it has spread in Mpumalanga and the coastal areas of KwaZulu-Natal and the Eastern Cape. Map 68.

Distinguished by its entire or 3-lobed leaves with a cordate base, the awned sepals and whitish salver-shaped corolla with the tube at least 70 mm long. For synonymy, see Verdcourt (1963a: 130). Keeler & Kaul (1979: 946) studied the petiolar nectaries in this species.



MAP 68.—● *Ipomoea alba*
▲ *I. rubens*

Vouchers: *De Winter* 7552 (PRE); *Killick* 2250 (PRE).

48. ***Ipomoea rubens* Choisy** in Mémoires de la Société de Physique et d'Histoire Naturelle de Genève 6: 463 (1834); Verde.: 324 (1958a); Verde.: 134 (1963a); Roessler: 16 (1967a); Gonç.: 116 (1987); Gonç.: 122 (1992); Lejoly & Lisowski: 90 (1992). Types: India, Silhet and Goalpara, *Wallich* 1421 (G, syn.!, K!).

I. riparia G.Don: 265 (1837); A.Meeuse: 766 (1957a). Type: São Tomé, *G. Don* s.n. (BM, holo.).

Perennial twiner. Stems rather woody, finely striate, densely white-pubescent, up to 4 m long. Leaves broadly ovate to orbicular, 50–150 × 40–120 mm, apex acuminate, mucronulate, base broadly cordate, entire or rarely 3-lobed, densely pilose beneath, glabrescent above, nerves prominent below; petiole pilose, 30–120 mm. Peduncles pilose to glabrous, 20–150 mm, cymosely 1- to few-flowered; flowers subumbellate; pedicels 7–15 mm long, pilose; bracts minute. Sepals subequal, pilose, 6–8 mm long; 2 outer ones elliptic-oblong; inner ones ovate-elliptic. Corolla funnel-shaped, 40–50 mm long, purple or mauve with darker centre; mid-petaline areas hairy outside. Capsule globose, glabrous, ± 12 mm in diameter. Seeds ovoid, 6 mm long, densely white-villous. Flowering time throughout the year.

Widespread in tropical Africa, Madagascar and the Mascarene Islands, also in India, Malaysia, the Philippines and Guyana. In southern Africa it has been recorded from northern Namibia and northern Botswana. Restricted to swamps near rivers and lakes and on seasonally inundated clays and silts. Flowering throughout the year. Map 68.

Distinguished by its habitat and also its entire or 3-lobed leaves with cordate bases, its elliptic-oblong to ovate-elliptic pilose sepals and 40–50 mm long purple or mauve corollas. This species has been described several times under various names. For the synonymy, see Meeuse (1957a: 766), Verdcourt (1963a: 134) and Gonçalves (1987: 116).

Vouchers: *Gibbs* 2366 (PRE, SRGH); *Giess* 8867 (M, PRE, WIND).

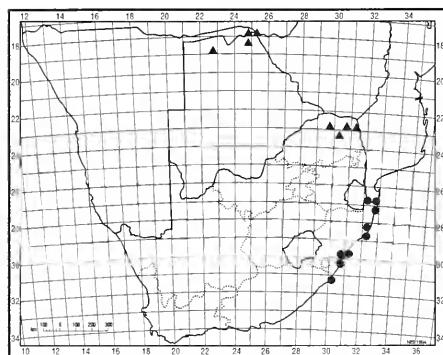
49. ***Ipomoea mauritiana* Jacq.**, Collectanea austriaca ad botanicum ... 4: 216 (1791); Heine: 351 (1963); Verde.: 135 (1963a); Gonç.: 117 (1987); Gonç.: 123 (1992); Lejoly & Lisowski: 91 (1992); Gonç.: 38 (1996). Type: a plant from Mauritius cultivated at Vienna, probably not preserved.

I. digitata sensu auctt. non L.; A.Meeuse: 767 (1957a).

Large, glabrous, perennial liana. Roots tuberous. Stems twining, rarely prostrate, hollow, becoming woody. Leaves ovate-cordate to orbicular in outline, 60–200 × 60–150 mm, base cordate or truncate, entire to shallowly lobed or palmately dissected beyond the middle; lobes 3–9, lanceolate to ovate, entire, apex acuminate to obtuse; petiole smooth or muriculate, 30–110 mm long. Peduncles terete to angular, cymosely branched near apex, few- to many-flowered, 25–200 mm long; pedicels 9–25 mm long. Sepals equal or outer ones shorter, all suborbicular or outer ones narrower, obtuse, markedly convex, coriaceous, 6–12 mm long. Corolla funnel-shaped with spreading limb, 50–60 mm long, 60–70 mm wide, tube narrow below and then widening, reddish purple or mauve with darker centre. Capsule globose or ovoid, 12–14 mm long. Seeds black, 5–7 mm long, with ± 7 mm long whitish silky hairs. Flowering time January to May.

Circumtropical, mostly in lowland rain forest, riverine bush, secondary woodland and swampy areas, especially in coastal parts, often on sandy soils, also along roadsides. Found along the coastal strip of KwaZulu-Natal. Map 69.

Distinguished by being a glabrous perennial liana with entire to palmate leaves, obtuse and suborbicular sepals and a purple or mauve corolla with the tube narrow below. Keeler & Kaul (1979: 946) studied the petiolar nectaries in *I. mauritiana*. The name *Ipomoea digitata* L., long used for this species, actually applies to a rare endemic Haitian species.



MAP 69.—● *Ipomoea mauritiana*
▲ *I. shirambensis*

Vouchers: *Vahrmeijer* 501 (PRE); *Ward* 4847 (PRE, UDW).

50. ***Ipomoea shirambensis* Baker** in Kew Bulletin 1894: 72 (1894); Hallier f.: 49 (1899a); Baker & Rendle: 186 (1905–06); A.Meeuse: 770 (1957a); Verdc.: 134 (1963a); Gonç.: 114 (1987); Gonç.: 120 (1992); Lejoly & Lisowski: 88 (1992); A.Fabian & Germish.: 336, t. 160d (1997); Retief & P.P.J.Herman: 386 (1997). Type: Mozambique, Lower Zambezi, Shiramba, *Kirk* 93 (K, holo.).

Tall perennial woody climber, up to 7.5 m high. Stems mostly glabrous, older stems with greyish or yellowish bark and raised longitudinal ridges. Leaves borne on new shoots, ± fasciculate, deciduous, ovate to orbicular or narrowly triangular, 30–75 mm × 10–45 mm, entire, apex long-acuminate, base cordate to truncate, densely pubescent to glabrous; petiole up to 30 mm long. Flowers often appearing before leaves, solitary or in 2–20-flowered, congested, fascicle-like cymes, borne on older shoots; peduncles and cyme branches very short; bracts minute; pedicel up to 20 mm long, thickening upwards. Sepals 9–15 mm long, accrescent in fruit, glabrous, oblong-lanceolate to ovate, apex acute, mucronate, unequal; inner ones larger. Corolla funnel-shaped, white, mauve to purple, 35–55 mm long, limb as wide, glabrous; mid-

petaline areas conspicuous. Capsule elongate-ovoid, glabrous, up to 20 mm long, style base persistent, 10 mm long. Seeds ± 12 mm long, elongate-oval, with brownish silky hairs up to 12 mm long. Flowering time July to October.

From Tanzania southwards to Zimbabwe and Mozambique, extending into the Caprivi, northern Botswana and the Northern Province. Grows in savanna and bushveld, often on sandy soils. Frequently flowering when completely leafless. Map 69.

Distinguished by being a tall, woody, perennial climber with entire leaves usually appearing after the 35–55 mm long, white to purple flowers.

The cut stems are reported to provide drinkable water (Watt & Breyer-Brandwijk 1962: 310).

Vouchers: *Codd* 7581 (PRE); *Van der Schijff* 3189 (PRE).

51. ***Ipomoea adenoides* Schinz**, Verhandlungen des Botanischen Vereins der Provinz Brandenburg, Berlin 30: 270 (1888); Baker & C.H.Wright: 51 (1904); Baker & Rendle: 195 (1905–06); N.E.Br.: 122 (1909); A.Meeuse: 770 (1957a); Verdc.: 342 (1960); Roessler: 12 (1967a); Gonç.: 120, t. 31 (1987); A.Fabian & Germish.: 334, t. 159e (1997); Retief & P.P.J.Herman: 382 (1997); W.G.Welman, C.Craig & G.Candy: 100, t. 2157 (1999). Type: Namibia, Lüderitz, *Belck* 21 (Z, syn.); Kaokoveld, Schinz s.n. (Z, syn.).

I. marlothii Engl.: 244 (1888). Type: Namibia, Usakos, *Marloth* 1250 (PRE, iso!).

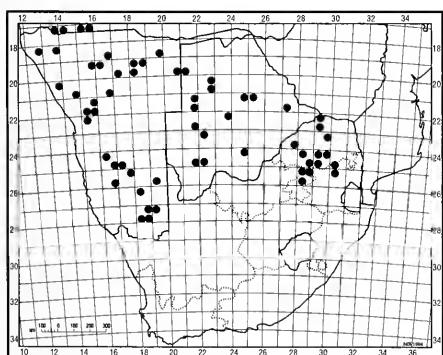
Rivea adenoides (Schinz) Hallier f.: 156 (1893a). Type: as for *I. adenoides*.

Erect shrub up to ± 1.2 m high. Stems shortly silky hairy when young, glabrous or greyish or yellowish canescent when older. Leaves at tips of young branches, firm to subcoriaceous, entire, lanceolate varying to obovate-orbicular, 30–80 × 10–15 mm, base usually cuneate, tip obtuse to acute, often with a white-hairy mucro,

green and glabrescent above, silky beneath, ultimately glabrescent; margin ciliate; petiole much shorter than leaf, silky pubescent. *Peduncles* 1-flowered, short, silky pubescent as are bracteoles, pedicels and calyx; bracteoles 8–18 mm long; pedicels very short. *Sepals* subequal, lanceolate, 15–18 mm long, up to 28 mm long in fruit. *Corolla* salver-shaped, tube 70–100 mm long, narrowly cylindric, greenish white and silky outside, deep magenta and glabrous inside; limb white, 45–60 mm wide, spreading, silky on midpetaline areas outside. *Capsule* ovoid, 19–23 mm long, hairy to glabrous. *Seeds* \pm 10 mm long, densely covered with very long, shiny, brownish hairs. *Flowering time* November to May.

Widely distributed from Angola, Zimbabwe, Namibia and Botswana into South Africa, mainly in the Northern Province. Mostly in sandveld and sparse bushveld, on limestone and sandy loam soil, not in very arid areas. Sometimes locally abundant and even regarded as a weed (Wells *et al.* 1986: 302). Map 70.

Distinguished by its erect, shrubby habit, densely silky-hairy sepals and salver-shaped corolla with a narrow tube at least 70 mm long, hairy on the outside. This species has nocturnal flowers. According to Gonçalves (1987: 122), the var. *ovato-lanceolata* Hallier f. has ovate-lanceolate leaves and occurs in Ethiopia and Somalia.



MAP 70.—*Ipomoea adenoides*

Vouchers: *Acocks* 18113 (PRE); *Carr* 102 (PRE); *Codd* 6293 (PRE).

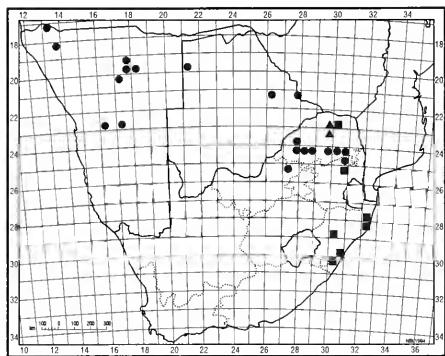
52. *Ipomoea holubii* Baker in Kew Bulletin 1894: 72 (1894); Baker & Rendle: 188 (1905–06); A.Meeuse & W.G.Welman: 47 (1996). Type: Botswana, Leshumo Valley, *Holub* 512 (K, holo.).

Rivea holubii (Baker) Hallier f.: 25 (1910). Type as above.

Turbina holubii (Baker) A.Meeuse: 780 (1957a); A.Meeuse: t. 1271 (1958b); A.Fabian & Germish: 336, t. 160e (1997); Retief & P.P.J.Herman: 387 (1997). Type as above.

Much-branched shrub up to 2.5 m high. *Stems* woody, many from base, covered with a light grey bark, sinuous, tips decumbent or climbing. *Leaves* deciduous, ovate-cordate to orbicular-cordate, 10–80 \times 7.5–50.0 mm, entire, often folded along midrib, apex obtuse or subacute, deflexed, base mostly widely cordate, sericeous to tomentose on both surfaces, more densely so beneath; petiole pubescent, 4–25 mm long. *Inflorescence* axillary, 1–5-flowered, sometimes forming a kind of leafy panicle at tips of branches; peduncle 25–90 mm long, hairy; pedicels 8–30 mm long, hairy; bracteoles hairy, 2.5–15.0 mm long, often numerous and forming a kind of involucre at base of cyme and then one bracteole foliaceous and up to 40 \times 20 mm. *Calyx* 6–16 mm long, usually greyish pubescent to tomentose, unequal, elliptic to obovate-spathulate, outer sepals smaller than inner ones, all accrescent in fruit, then glabrescent and brown. *Corolla* funnel-shaped, 40–50 mm long, pale mauve or pinkish with magenta centre, limb spreading horizontally up to \pm 60 mm wide; midpetaline areas strigose outside. *Capsule* with thin leathery pericarp, ellipsoid, apiculate, 8–10 mm long. *Seed* single, ellipsoid, \pm 7 mm long, glabrous, light brown. *Flowering time* November to May.

Occurs in Malawi, Zambia, Zimbabwe, Mozambique, Namibia, Botswana and mainly the Northern Province. Grows in bushveld and grassland, also along roadsides and often on rocky soil. Map 71.



MAP 71.—● *Ipomoea holubii*
▲ *I. stenosiphon*
■ *I. carnea* subsp. *fistulosa*

Distinguished by its shrubby habit, its often folded deciduous leaves and greyish, elliptic to obovate-spathulate sepals.

Vouchers: *Barnard* 614 (PRE); *Giess & Müller* 14815 (M, PRE, WIND); *Meeuse* 9654 (PRE).

53. ***Ipomoea stenosiphon* Hallier f.** in Sitzungsberichte der Akademie der Wissenschaften in Wien 107, 1: 50 (1898b); Baker & Rendle: 192 (1905–06); A. Meeuse & W.G. Welman: 47 (1996). Type: Kenya, Taveta, Kilimanjaro, *Pospischil* s.n. (W, holo.).

Turbinaria stenosiphon (Hallier f.) A. Meeuse: 783 (1957a); Gonç.: 125, t. 32 (1987); Gonç.: 129, t. 28 (1992); Lejoly & Lisowski: 392, fig. 11 (1993b); Retief & P.P.J. Herman: 388 (1997). Type as above.

T. stenosiphon (Hallier f.) A. Meeuse var. *pubescens* Verdc.: 217 (1958c). Type: Tanzania, Manyoni, *B.D. Burtt* 3578 (K, holo.; EA).

Tall, climbing or rambling shrub. Stems up to 10 m long, glabrous, older parts with a yellowish grey separable bark; flowering branches frequently with rugose bark, densely leafy towards apex. Leaves sometimes fascicled on very short branchlets, cordate or cordate-ovate, 30–110 × 25–75 mm, mostly entire, apex emarginate to acute, mucronate, basal sinus wide and distinct, glabrous to densely pubescent mainly on lower

nerves, reticulate venation conspicuous beneath, lower surface mostly dotted with numerous black glands; petiole 20–95 mm long. Peduncles very short or obsolete; pedicels solitary or 2–5-fascicled, 20–60 mm long; bracts very small, early deciduous. Calyx subcylindrical, subglabrous, 14–17 mm long; sepals oblong to elliptic, apex obtuse to emarginate, outer ones shorter, all much enlarged in fruit, up to 40 mm long. Corolla white, cream-coloured to greenish yellow, tube 80–150 mm long, very slender, limb 30–40 mm wide, salver-shaped with woolly hairs near apices of midpetaline areas outside; stamens and style conspicuously exerted. Capsule ellipsoid, 20–30 mm long, dirty brown, glabrous, cuspidate by thick, awn-shaped, persistent, 12–15 mm long style base. Seeds 1–3, oblong, 11–15 mm long, purple-brown, velvety pubescent. Flowering time December to June.

From Kenya and the Sudan to the Democratic Republic of the Congo and southwards to Zimbabwe and Mozambique; some records from the Northern Province. Usually rare in deciduous bushland, riverine thickets, on termite mounds or rocky soil. Map 71.

The flowers are said to be evil-smelling, they open at night and are probably pollinated by hawk-moths. Could easily be overlooked because the corolla shrivels up during the day. Distinguished by its woody habit, flowering branches that are densely leafy towards the apex and its salver-shaped, whitish corolla with 80–150 mm long, narrow tubes.

Vouchers: *Raal* 463 (PRE); *Raal* 511 (PRE).

54. ***Ipomoea carnea* Jacq.**, Enumeratio systematica plantarum: 13 (1760). Iconotype: specimen illustrated in Jacq.: t. 18 (1763), from Cartagena, Colombia.

*subsp. *fistulosa* (Mart. ex Choisy) D.F. Austin in Taxon 26: 237 (1977); W.G. Welman: 141 (1997). Type: Brazil, *Martius* 2398 (M, lecto.).

I. fistulosa Mart. ex Choisy: 349 (1845); Lejoly & Lisowski: 94 (1992).

Erect to scrambling shrubs up to 3 m high. *Stems* woody at base, herbaceous at tips, hollow, glabrous or minutely pubescent. *Leaves* ovate to lanceolate, 100–250 mm long, entire, truncate to shallowly cordate at base, long-acuminate apically, pubescent on both sides but sometimes glabrescent; petiole 20–100 mm long. *Flowers* in cymose-paniculate clusters at branch tips, 1–several-flowered. *Sepals* 5, suborbicular, 5–6 mm long, somewhat unequal, subcoriaceous, glabrous or pubescent, persistent. *Corolla* funnel-shaped, 5-lobed, deep pink to rose-purple, throat darker than limb, 50–90 mm long, finely tomentose outside; midpetaline areas well defined. *Stamens* 5. *Capsule* ovoid to subglobose, 20 × 10–15 mm, glabrous. *Seeds* usually 4, covered with long, comose brown trichomes. *Flowering time* throughout the year (Austin 1975).

Ipomoea carnea, with two subspecies, is of tropical American origin. The subsp. *carnea* seems to be confined to its natural distribution area from Peru to Mexico. However, the subsp. *fistulosa*, with a natural distribution area from Argentina to Florida and Texas, has been introduced to Hawaii and the tropics of the Old World where it has often escaped from cultivation (Verdcourt 1963a; Gonçalves 1987). In southern Africa it is found in the Northern Province, Mpumalanga, KwaZulu-Natal and probably also in Swaziland. It is listed as *I. fistulosa* by Welman in Arnold & De Wet (1993). The subsp. *carnea* prefers dry habitats whereas subsp. *fistulosa* prefers wet habitats. In southern Africa this subspecies is suberect and grows in open, sunny sites, often climbing in shaded areas. It is cultivated as an ornamental as well as in hedges and windbreaks and often occurs as a culture relic and escape from cultivation. It will then occur in disturbed areas such as along roadsides, but also in grassland, along river banks and in other moist areas. C.J. Ward 12368 (PRE, UDW), collected below the Inanda Dam wall in KwaZulu-Natal in August 1993, appears to be naturalised. Map 71.

The subsp. *fistulosa* is distinguished by lanceolate to ovate leaves whereas the subsp. *carnea* has cordate to rounded leaves.

The subsp. *fistulosa*, often regarded as a pantropical weed, has been recorded as poisonous to goats in India, the Sudan, Tanzania and also in Mozambique (see Welman 1997; De Balogh, Dimande, Van der Lugt, Molyneux, Naudé & Welman 1999: 266). Keeler & Kaul (1979) studied the petiolar nectaries in *I. carnea*. Sinha & Sharma (1992) reported a chromosome count of $2n = 30$. Ugborogho & Ogunwenmo (1995) investigated the biology of this species in Nigeria, while Mondal, Parui, Biswas & Mandal (1997) identified the allergenic proteins of the pollen.

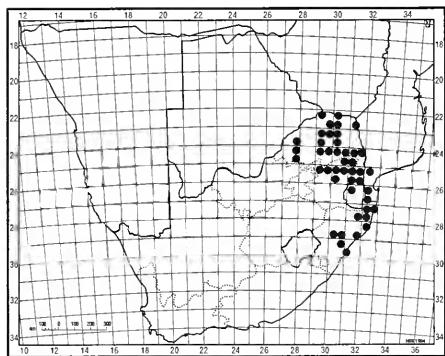
Vouchers: Henderson 879 (PRE); Mudau s.n. (VENDA); Strey 10595 (NH, PRE).

55. *Ipomoea albivenia* (*Lindl.*) Sweet, *Hortus britanicus*, 2nd edn: 372 (1830); Hallier f.: 151 (1893a); J.M.Wood: 32, t. 38 (1899); Baker & C.H.Wright: 59 (1904); A.Meeuse: 768 (1957a); Verde.: 140 (1963a); Gonç.: 118 (1987); Gonç.: 124 (1992); A.Fabian & Germish.: 334, t. 159g (1997); Retief & P.P.J.Herman: 383 (1997). Type: Mozambique, Delagoa Bay, *Forbes s.n.*, a cultivated plant grown from seed, probably not preserved, but figured under *Convolvulus albivenius* by Lindl.: t. 1116 (1827b).

Convolvulus albivenius Lindl.: t. 1116 (1827b).

I. gerrardii Hook.f.: t. 5651 (1867). Type: KwaZulu-Natal, *Sutherland s.n.*, a cultivated plant grown from seed at Kew, probably not preserved.

Perennial climbing shrub. *Roots* tuberous. *Stems* slender, herbaceous and white-tomentose when young, soon glabrous; woody when older, up to more than 10 m long. *Leaves* broadly cordate to cordate-reniform, 30–100(–170) × 30–100(–160) mm, texture firm, base cordate to truncate, apex rounded to cuspidate, margin entire to sinuous, white-tomentose when young, glabrescent, tomentum persisting the longest on lower veins, ultimately sometimes quite glabrous; petiole slender, white-tomentose, 10–60 (–80) mm long. *Peduncles* very short, 1-flowered or bearing a lax, few-flowered cyme, tomentose; bracteoles longer than calyx, linear or oblong-spathulate, membranous, brown, early deciduous; pedicels short, tomentose. *Sepals* subequal,

MAP 72.—*Ipomoea albivenia*

oblong to ovate-orbicular, obtuse, chartaceous, 11–15 mm long, tomentose to glabrescent, spreading to reflexed in fruit. *Corolla* funnel-shaped, white or cream-coloured, 60–90 mm long, limb 60–80 mm wide, glabrous. *Capsule* ± ellipsoid, 16–22 mm long, brown, glabrous, apiculate. *Seeds* brown, 7–9 mm long, densely covered with very long cottony white hairs. *Flowering time* December to March.

Recorded from Kenya, Mozambique, Zimbabwe and the Northern Province, Mpumalanga, KwaZulu-Natal and Swaziland. Found in woodland, savanna, riverine and coastal bush, often on sandy soil. Rather common in southern Africa, especially in areas with a relatively high rainfall. Map 72.

Closely related to *I. verbascoidea* (no. 56), but distinguished by its glabrescent leaves and sepals and also a more easterly distribution. Both *I. albivenia* and *I. verbascoidea* are showy plants worth cultivating.

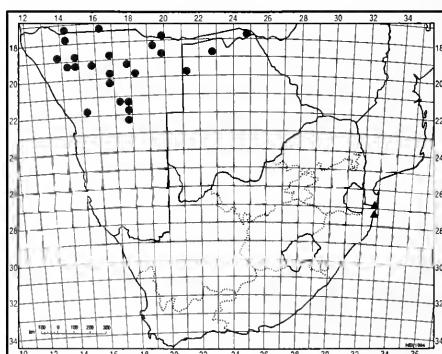
Roots reported to be used medicinally and also as a baby food (Watt & Breyer-Brandwijk 1962: 307).

Vouchers: Compton 25994 (PRE); Strey 4631 (NH, PRE); Welman 681 (PRE).

Naturelle de Genève 8: 56 (1837); Choisy: 356 (1845); Baker & Rendle: 183 (1905–06); A. Meeuse: 769 (1957a); Verdc.: 140, figs. 22 & 24 (1963a); Gonç.: 118 (1987); Gonç.: 125 (1992); Lejoly & Lisowskii: 94 (1992). Type: Angola, without locality, *Da Silva* s.n. (P, holo.).

I. dammarana Rendle: 36 (1896). Type: Namibia, Damaraland, *Een* s.n. (BM, holo.).

Suberect to climbing shrub. *Stems* woody, up to 2 m long or longer, densely covered with a yellowish or whitish, somewhat floccose tomentum (as are leaves, petioles, peduncles, bracts and sepals). *Leaves* cordate-oblong to suborbicular, 40–150 × 30–170 mm, apex obtuse to apiculate, base cordate or truncate, entire to somewhat crenate, upper surface thinly tomentose, glabrescent, lower surface more densely tomentose, veins conspicuous; petiole 15–100 mm long, bearing a gland on each side of insertion of lamina. *Peduncles* 1- to few-flowered, up to 30 mm long; bracts linear-oblong to oblanceolate, 14–20 mm long; pedicels ± 12 mm long. *Sepals* equal, elliptic, obtuse, 10–20 mm long. *Corolla* funnel-shaped, glabrous, 60–100 mm long, tube broadly cylindrical, limb 50–70 mm wide, white, rose-purple or mauve with darker throat. *Capsule* globose or oblong-ovoid, 20–25 mm long, glabrous. *Seeds* ovoid, brown, 6–8 mm long, densely covered with ± 20 mm long white or tawny cottony hairs. *Flowering time* November to March. Figure 18.

MAP 73.—● *Ipomoea verbascoidea*
▲ *I. consimilis*

56. *Ipomoea verbascoidea* Choisy in Mémoires de la Société de Physique et d'Histoire

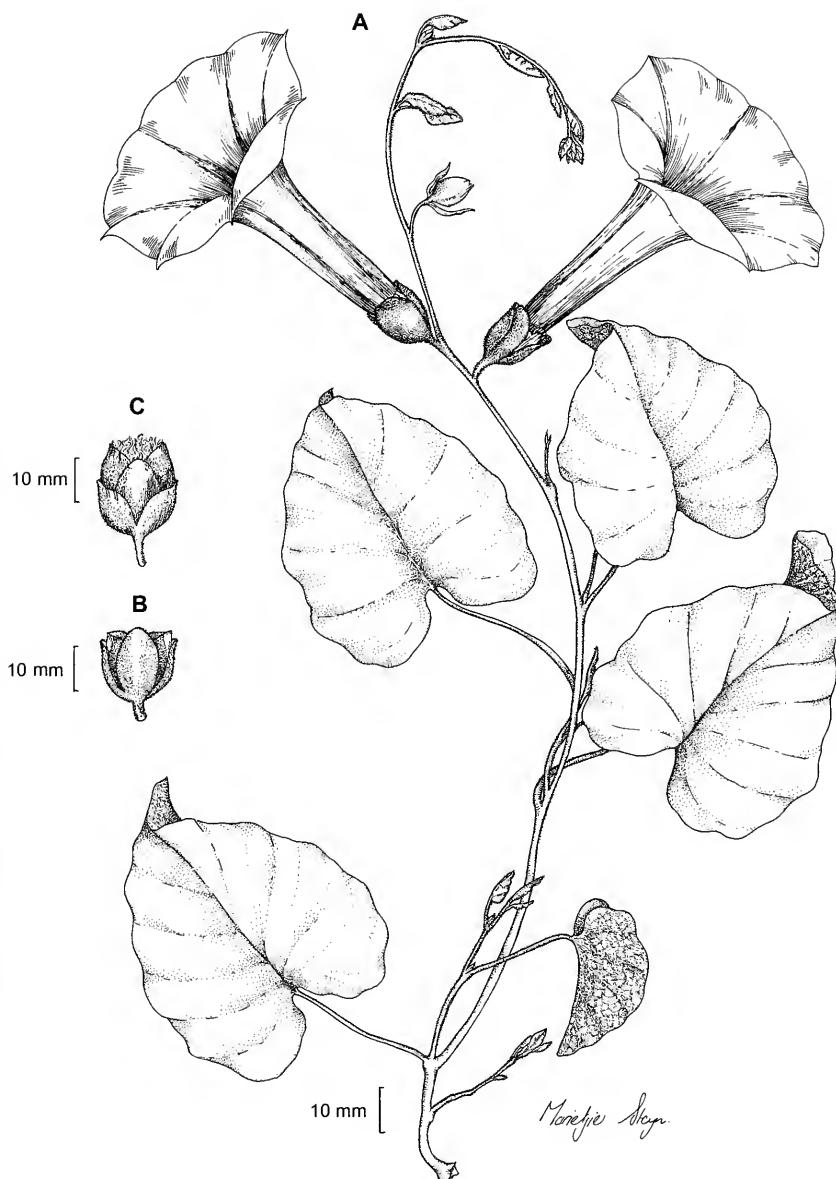


FIGURE 18.—*Ipomoea verbascoides*: A, flowering stem (*Germishuizen 7635, Le Roux 306, PRE*); B, calyx; C, fruiting calyx (*De Winter & Leistner 5817, PRE*). Artist: Marietjie Steyn.

Extends from the Sudan southwards to northern Namibia, the Caprivi and northern Botswana. Grows in bushveld and grassland, often on Kalahari sands. Map 73.

Closely related to *I. albivenia* (no. 55), but distinguished by the persistent white tomentum on the lower surface of the leaves, the young ones having in addition a raised tomentum on the main veins; the calyx is also densely tomentose for the most part, at least initially.

Vouchers: *Killick & Leistner* 3008 (PRE, SRGH); *Smith* 3508 (PRE, SRGH); *Smook* 7825 (PRE).

57. *Ipomoea consimilis* Schulze-Menz in Notizblatt des Botanischen Gartens und Museums zu Berlin-Dahlem 14: 112 (1938); Verdc.: 149 (1963a); Gonç.: 123 (1987); Gonç.: 126 (1992); A. Meeuse & W.G. Welman: 46 (1996). Type: Tanzania, Lindi, Bakari, Schlieben 5550 (B, holo.†, LD, photo.).

Climbing subshrub; young parts densely yellow-villous, glabrescent. Leaves broadly ovate, up to 250 × 200 mm, apex acuminate, base rounded to somewhat cordate, with yellow adpressed hairs below and on nerves above; petiole 25–95 mm, yellow-villous. Inflorescence a few-flowered cyme; peduncle up to 200 mm, yellow-villous; pedicels 20–40 mm, yellow-villous; bracts linear-lanceolate, up to 6 mm long. Sepals linear-lanceolate, subulate, 11–16 mm long, hairy outside, inner ones smaller than outer

ones. Corolla funnel-shaped, up to 65 mm long, mauve to purple; midpetaline areas hairy on outside. Capsule globose, brown, 12 mm wide. Seeds 8 mm long, covered with long fulvous hairs. Flowering time April and May.

Recorded from Tanzania (Lindi district), Mozambique (Sofala) and Maputaland in northern KwaZulu-Natal, on sandy soils in coastal or swamp forest. Map 73.

Distinguished by its climbing, shrubby habit, yellow-villous young parts, large ovate leaves and mauve to purple flowers.

The South African specimens of this species were previously listed under *I. urbaniana* (Dammer) Hallier f., which does not occur south of the Lindi district in Tanzania (see Ross 1972: 296).

Vouchers: *Strey* 8190 (NH, PRE); *Strey* 10443 (NH, PRE).

Excluded species

Ipomoea shupangensis Baker. Welman in Arnold & De Wet (1993: 594) lists this species for KwaZulu-Natal. However, no fertile material is known from southern Africa. *I. shupangensis* occurs in tropical Africa as far south as Zimbabwe (Hwange) and Mozambique (Gaza). See Verdcourt (1963a: 132), Gonçalves (1987: 114, t. 29), Gonçalves (1992: 118, t. 27), Meeuse & Welman (1996: 49).

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15. **PARALEPISTEMON**

Paralepistemon *Lejoly & Lisowski* in Bulletin du Jardin Botanique National de Belgique, Brussels 56: 196 (1986); Gonç.: 127 (1987); Gonç.: 132 (1992). Type species: *P. shirensis* (Oliv.) Lejoly & Lisowski.

Ipomoea L. pro min. parte.

Turbina Raf. pro min. parte.

This genus differs from *Ipomoea* as follows: *Stamens* inserted on triangular, large ($\pm 2 \times 2$ mm) glandular pilose scales situated near base of corolla tube. *Ovary* with a very short beak persistent in fruit. *Style* articulated at base, caducous. *Fruit* indihescent, \pm woody.

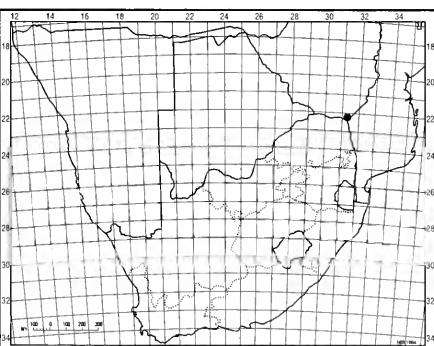
A genus with a single species confined to central and southern tropical and subtropical Africa.

Paralepistemon shirensis (Oliv.) Lejoly & Lisowski in Bulletin du Jardin Botanique National de Belgique, Brussels 56: 197 (1986); Gonç.: 127, t. 33 (1987); Gonç.: 132, t. 29 (1992); A.Meeuse & W.G.Welman: 47 (1996). Type: Malawi, Shire Highlands, Buchanan 262 (K, lecto.).

Ipomoea shirensis Oliv.: 58, t. 1474 (1884); Baker & Rendle: 189 (1905-06). *Rivea shirensis* (Oliv.) Hallier f.: 157 (1893a). *Turbina shirensis* (Oliv.) A.Meeuse: 782 (1957a); Retief & P.P.J.Herman: 388 (1997).

Robust shrubby climber up to 15 m tall. Stems woody, terete, up to 200 mm in diameter, whitish tomentose of very short appressed hairs, more densely so when young. Leaves broadly cordate to orbicular-ovate or cordate-ovate, 30-170 mm long and wide, entire, obtuse to acuminate or shortly and abruptly cuspidate at apex, often mucronulate, basal sinus wide and shallow to leaf base almost truncate, upper surface thinly and shortly pubescent, more densely so when young, densely white or greyish tomentose beneath; petiole rather slender, 15-120 mm long, densely tomentose. Inflorescence cymose in axils of upper leaves and forming lax terminal panicles; peduncle patent or erecto-patent, rather slender, densely tomentose like young stems and petioles, few- to many-flowered, 30-100 mm long; bracteoles thinly papery or almost membranous, oblong-ob lanceolate, oblong-ovate or somewhat narrowly oblong-spathulate, much narrowed and subpetiolate at base, 7-22 mm long, pale yellowish

brown when dry, hairy outside, glabrous inside, very early deciduous and rarely preserved; pedicels up to 20 mm long, densely tomentose. Sepals thin, almost papery, subequal, oblong or obovate-oblong, obtuse, densely sericeo-tomentose outside, 8-15 mm long, at first erect, much imbricate, later accrescent, glabrescent and spreading, ultimately papery and brittle, brown and often purplish outside, pale straw-coloured inside, 10-17 mm long. Corolla white, widely funnel-shaped, 15-20 mm long; midpetaline areas sharply defined, densely silvery. Fruit broadly ellipsoid or somewhat ovoid, 5-8 mm long, 5.0-6.5 mm wide, rounded-truncate to depressed at apex and shortly beaked, very densely greyish sericeo-tomentose, 1-seeded; pericarp hard, woody. Seed light brown or fawnish, subglobose-quadrangular, \pm 4 mm



MAP 74.—*Paralepistemon shirensis*

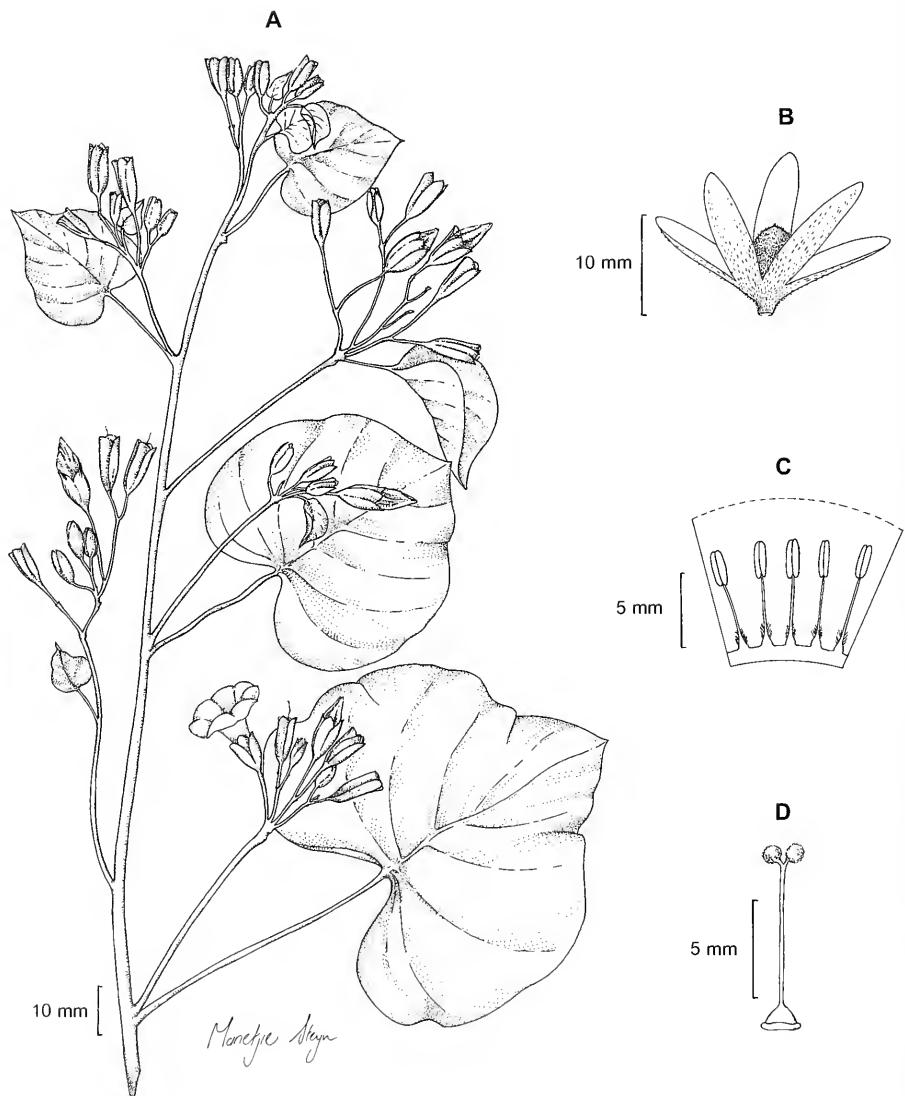


FIGURE 19.—***Paralepistemon shirensis***: A, flowering stem (*Van der Schijff & Marais 3723, PRE*); B, fruit with calyx; C, inside of corolla tube with stamens; D, ovary, style and stigmas (*Codd 5978, PRE*). Artist: Marietjie Steyn.

long, 3.5–4 mm wide, very shortly velutinous or puberulous. *Flowering time* March to July. Figure 19.

Recorded from the Northern Province, Zimbabwe, Zambia, Angola, Mozambique, Malawi and the Democratic Republic of the Congo. Grows in woodland, forest edges, riverine

scrub, grassland and also along roadsides, often on sandy soils and mostly above 500 m. Map 74.

Distinguished by its woody, shrubby, climbing habit, the cordate, entire leaves, lax panicles and 15–20 mm long, white corolla.

Voucher: *Zambatis* 1914 (PRE).

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16. STICTOCARDIA

Stictocardia *Hallier* f. in Botanische Jahrbücher 18: 159 (1893a); A.Meeuse: 772 (1957a); Verdc.: 5 (1961b); Verdc.: 68 (1963a); R.A.Dyer: 506 (1975); Gonç.: 48 (1987); Gonç.: 51 (1992). Type species: *S. tiliifolia* (Desr.) Hallier f.

Perennial, herbaceous or woody twiners. *Leaves* entire, ovate to orbicular, usually large, mostly cordate at base, densely covered with minute glands beneath (appearing as black dots in dried specimens). *Flowers* in axillary, pedunculate 1-many-flowered cymes; bracts small, deciduous. *Sepals* 5, ovate to orbicular, obtuse or rounded to emarginate, subequal, subcoriaceous, often with thinner margins, often much imbricate, enlarging in fruit. *Corolla* large, funnel-shaped with shallowly lobed to subentire limb, usually purple, magenta or reddish; midpetaline areas often somewhat hairy and with minute glands like leaves. *Stamens* inserted near base of corolla tube; pollen globose, spinulose. *Disc* annular, entire or somewhat 5-lobed. *Ovary* glabrous, 4-locular, 4-ovuled; style 1, filiform; stigma biglobular. *Fruit* enclosed in accrescent calyx, globose, winged, woody; walls between wings thin, breaking irregularly and fruit becoming lantern-shaped. *Seeds* 4, dark brown or black, pubescent.

A small genus of about 12 species found throughout the tropics, one species in southern Africa.

Austin & Sebsebe (1997) studied the fruits of *Stictocardia* and concluded that the genus should be maintained as distinct mainly because of the following fruit characters: enlarged calyx, thin exocarp, 4-lobed septum, 4-lobed loculicidal endocarp. Derooin (1999) studied ovary morphology in the Convolvulaceae- Ipomoeae and stated that *Stictocardia* appears to retain some archaic characters, such as a woody habit and a nonglobular ovary with a protruding nectariferous disc. The tropical African *S. beraviensis* (Vatke) Hallier f., a perennial climber with bright crimson flowers, is sometimes cultivated in warmer areas.

Stictocardia laxiflora (Baker) Hallier f. in Bulletin de l'Herbier Boissier 6: 548 (1898a); Verdc.: 5 (1961b); Verdc.: 71 (1963a); Gonç.: 49, t. 15 (1987); Gonç.: 53, t. 14 (1992); A.Meeuse & W.G.Welman: 49 (1996). Type: Malawi, Shire Highlands, Buchanan 388 (K, holo.).

Argyreia ? *laxiflora* Baker: 67 (1894). *S. beraviensis* (Vatke) Hallier f. subsp. *laxiflora* (Baker) Verdc.: 189 (1958b).

Ipomoea *woodii* N.E.Br.: 101 (1894); Baker & C.H.Wright: 60 (1904); J.M.Wood: t. 557 (1912). *S. woodii* (N.E.Br.) Hallier f.: 548 (1898a); A.Meeuse: 773 (1957a); Verdc.: 189 (1958b). *S. laxiflora* (Baker) Hallier f. var. *woodii* (N.E.Br.) Verdc.: 173 (1963b); Verdc.: 71 (1963a); Gonç.: 51 (1987); Gonç.: 53 (1992). Type: KwaZulu-Natal, Durban, Wood 4146; 4864 (K, syn. NH!).

Perennial with a large tuberous rootstock. *Stems* stout, older portions decumbent and up to 7 m long or longer, younger portions creeping or climbing, finely pubescent, glabrescent. *Leaves* orbicular-cordate with broad, shallow

basal sinus, up to 250 mm long and wide, thinly hairy to quite glabrous, apex obtuse to acuminate, minutely emarginate and mucronate; petiole 50–150 mm long, stout, channelled above. *Inflorescence* cymosely 3–8-flowered or in upper portions of stems 1–3-flowered; common peduncle 20–60 mm long, stout; pedicels up to ± 30 mm long; bracteoles early deciduous, minute. *Calyx* somewhat inflated, glabrous; sepals subequal, strongly imbricate, concave, coriaceous, ovate-oblong, obtuse or rounded at apex, 8–10 mm long, outer ones slightly larger than inner ones. *Corolla* funnel-shaped, with rose-pink lobes with yellowish tube, 65–80 mm long, limb as wide, spreading, shallowly 5-lobed, lobes rounded to emarginate; midpetaline areas very distinct, quite glabrous or bearded at apex. *Stamens* somewhat unequal, 20–25 mm long, included, shorter than style. *Style* 30 mm long, stigma rough. *Capsule* unknown. *Seed* unknown. *Flowering time* December to July. Figure 20.

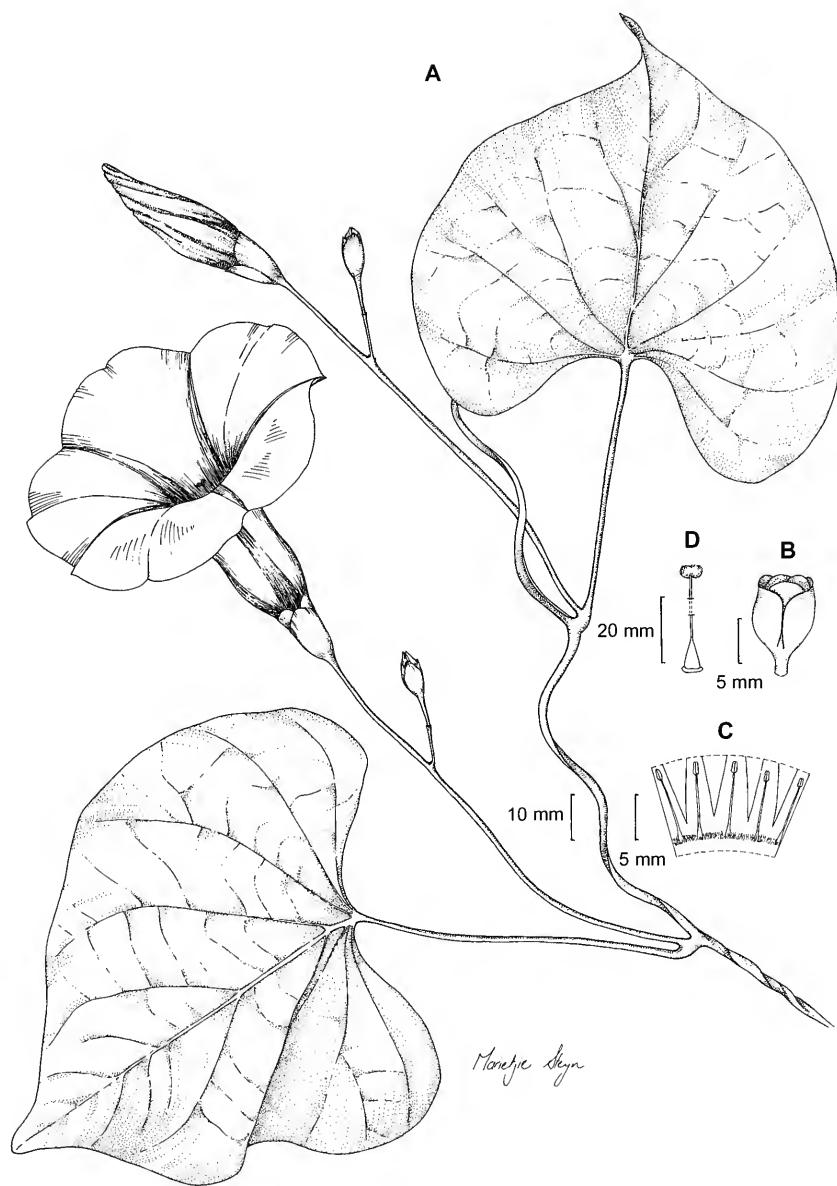
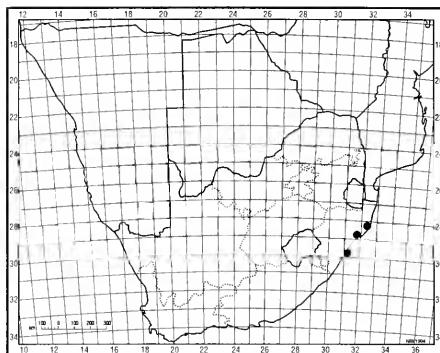


FIGURE 20.—*Stictocardia laxiflora*: A, flowering stem (*Strey 4680, PRE*); B, calyx; C, inside of corolla tube with stamens; D, ovary, style and stigma (*Ward 7070, PRE*). Artist: Marietjie Steyn.

Reported from the eastern part of tropical and subtropical Africa, namely Tanzania, Malawi, Zimbabwe and Mozambique, reaching the Ngoye Forest in KwaZulu-Natal. Grows in evergreen bush in rain and riverine forests, mostly in lowlands. Van Wyk (1996) lists this species as particularly prevalent in the Maputaland Centre of Endemism, which comprises the northernmost part of the Tongaland-Pondoland Regional Mosaic. Map 75.

Distinguished by its woody climbing or creeping habit, leaves with minute black dots beneath and pinkish yellow flowers with quite prominent midpetaline areas. In the past, features like the length of the peduncles and the pedicels were used to distinguish *S. laxiflora* var. *woodii*. However, the description by Meeuse (1957a) was based on a whole series of herbarium specimens, all from a single plant grown in the Durban Botanical Garden. The range of variation is so broad that such distinctions cannot be made.



MAP 75.—*Stictocardia laxiflora*

This species could make a very showy garden plant.

Vouchers: Strey 4680 (NH, PRE); Ward 7070 (PRE, UDW).

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APPENDIX

PLAN OF FLORA OF SOUTHERN AFRICA

Cryptogam volumes will in future not be numbered, but will be known by the name of the group they cover. The number assigned to the volume on *Charophyta* therefore becomes redundant. Occasional contributions to the *Flora* are published in *Bothalia* under the title *FSA contributions*.

Exotic families are marked with an asterisk.

Published volumes and parts are shown in bold.

INTRODUCTORY VOLUMES

The genera of southern African flowering plants

Vol. 1: Dicotyledons (1975)

Vol. 2: Monocotyledons (1976)

Botanical exploration of southern Africa (1981)

CRYPTOGAM VOLUMES

Charophyta (as Vol. 9 in 1978)

Bryophyta: Part 1: Musci: **Fascicle 1:** Sphagnaceae, Andreaeaceae, Fissidentaceae, Nanobryaceae, Archidiaceae, Ditrichaceae, Seligeriaceae, Dicranaceae, Calymperaceae, Encalyptaceae, Pottiaceae, Bryobartramiaeae, Grimmiaceae (1981)

Fascicle 2: Gigaspermaceae, Ephemерaceae, Funariaceae, Splachnaceae, Bryaceae, Mniacaceae, Eustichiaceae, Rhizogoniaceae, Aulacomniaceae, Bartramiaceae (1987)

Fascicle 3: Erpodiaceae, Rhachiteciaceae, Ptychomitriaceae, Orthotrichaceae, Rhabdoweisiaceae, Racopilaceae, Fontinalaceae, Wardiaceae, Hedwigiaeae, Cryphaeaceae, Leucodontaceae, Prionodontaceae, Trachypodaceae, Pterobryaceae, Meteoriaceae, Leptodontaceae, Neckeraceae, Thamnobryaceae, Hookeriaceae (1998)

Fascicle 4: Fabroniaceae, Leskeaceae, Thuidiaceae, Rigodiaceae, Amblystegiaceae, Brachytheciaceae, Entodontaceae, Plagiotheciaceae, Catagoniaceae, Sematophyllaceae, Hypnaceae, Hylocomiaceae, Polytrichaceae

Hepatophyta: Part 1: Marchantiopsida: **Fascicle 1:** Targioniaceae, Lunulariaceae, Aytoniaceae, Cleveaceae, Exormothecaceae, Marchantiaceae, Oxymitraceae, Ricciaceae (1999)

Anthocerotophyta

Pteridophyta (1986)

FLOWERING PLANTS VOLUMES

Vol. 1: Stangeriaceae, Zamiaceae, Podocarpaceae, Pinaceae*, Cupressaceae, Welwitschiaceae, Typhaceae, Zosteraceae, Potamogetonaceae, Ruppiaceae, Zannichelliaceae, Najadaceae, Aponogetonaceae, Juncaginaceae, Alismataceae, Hydrocharitaceae (1966)

Vol. 2: Poaceae

Vol. 3: Cyperaceae, Arecaceae, Araceae, Lemnaceae, Flagellariaceae

Vol. 4: Part 1: Restionaceae

Part 2: Xyridaceae, Eriocaulaceae, Commelinaceae, Pontederiaceae, Juncaceae (1985)

Vol. 5: Part 1: Colchicaceae, Eriospermaceae, Asphodelaceae (*Chortolirion*, 1995 in *Bothalia* 25: 31–33; *Poellnitzia*, 1995 in *Bothalia* 25: 35, 36)

Part 2: Alliaceae, Liliaceae*, Hyacinthaceae, Agavaceae (1996 in *Bothalia* 26: 31–35)

Part 3: Dracaenaceae, Asparagaceae, Luzuriagaceae, Smilacaceae (1992)

Vol. 6: Haemodoraceae, Amaryllidaceae, Hypoxidaceae, Tecophilaeaceae, Velloziaceae, Dioscoreaceae

Vol. 7: Iridaceae: Part 1: Nivenioideae, Iridoideae
 Part 2: Ixioideae; Fascicle 1: Ixieae (First part): Ixiinae, Tritoniinae (1999)
 Fascicle 2: *Syringodea, Romulea* (1983)

Vol. 8: Musaceae, Strelitziaceae, Zingiberaceae (1998 in *Bothalia* 28: 35–39), Cannaceae*, Burmanniaceae, Orchidaceae (*Holothrix*, 1996 in *Bothalia* 26: 125–140)

Vol. 9: Casuarinaceae*, Piperaceae, Salicaceae, Myricaceae, Fagaceae*, Ulmaceae (1999 in *Bothalia* 29: 239–247), Moraceae, Cannabaceae* (1999 in *Bothalia* 29: 249–252), Urticaceae, Proteaceae

Vol. 10: Part 1: **Loranthaceae, Viscaceae (1979)**, Santalaceae, Grubbiaceae, Opiaceae, Olacaceae, Balanophoraceae, Aristolochiaceae, Rafflesiaceae, Hydnoraceae, Polygonaceae, Chenopodiaceae, Amaranthaceae, Nyctaginaceae

Vol. 11: Phytolaccaceae, Aizoaceae, Mesembryanthemaceae

Vol. 12: Portulacaceae, Basellaceae, Caryophyllaceae, Illecebraceae, Cabombaceae, Nymphaeaceae, Ceratophyllaceae (1997 in *Bothalia* 27: 125–128), Ranunculaceae, Menispermaceae, Annonaceae, Trimeniaceae, Lauraceae, Hernandiaceae, Papaveraceae, Fumariaceae

Vol. 13: Brassicaceae, Capparaceae, Resedaceae, Moringaceae, Droseraceae, Roridulaceae, Podostemaceae, Hydrostachyaceae (1970)

Vol. 14: Crassulaceae (1985)

Vol. 15: Vahliaceae, Montiniaceae, Escalloniaceae, Pittosporaceae, Cunoniaceae, Myrothamnaceae, Bruniaceae, Hamamelidaceae, Rosaceae, Connaraceae

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 Fascicle 4: Psoraleeae–Galegeae
 Fascicle 5: Loteae–Liparieae
Fascicle 6: Crotalarieae (*Aspalathus*) (1988)
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 Fascicle 8: Crotalarieae (*Lotononis–Wiborgia*)
 Fascicle 9: Crotalarieae (*Pearsonia–Argyrolobium*), Genisteae (*Cytisus–Ulex*)

Vol. 17: Geraniaceae, Oxalidaceae

Vol. 18: Part 1: Linaceae, Erythroxylaceae, Zygophyllaceae, Balanitaceae
 Part 2: Rutaceae
Part 3: Simaroubaceae, Burseraceae, Ptaeroxylaceae, Meliaceae (Aitoniacae), Malpighiaceae (1986)

Vol. 19: Part 1: Polygalaceae, Dichapetalaceae
 Part 2: Euphorbiaceae, Calitrichaceae, **Buxaceae (1996 in *Bothalia* 26: 37–40)**
 Part 3: Anacardiaceae: **Fascicle 1: Rhus (1993)**
 Fascicle 2: remaining genera
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Vol. 20: Celastraceae, Icacinaceae, Sapindaceae, Melianthaceae, Greyiaceae, Balsaminaceae, Rhamnaceae, Vitaceae

Vol. 21: **Part 1: Tiliaceae (1984)**
 Malvaceae, Bombacaceae, Sterculiaceae

Vol. 22: Ochnaceae, Clusiaceae, Elatinaceae, Frankeniaceae, Tamaricaceae, Canellaceae, Violaceae, Flacourtiaceae, Turneraceae, Passifloraceae, Achariaceae, Loasaceae, Begoniaceae, Cactaceae (1976)

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Vol. 24: Rhizophoraceae, Combretaceae, Myrtaceae, Melastomataceae, **Onagraceae (1997 in *Bothalia* 27: 149–165)**, Trapaceae (1998 in *Bothalia* 28: 11–14), Haloragaceae, Gunneraceae, Araliaceae, Apiaceae, Cornaceae

Vol. 25: Ericaceae

Vol. 26: Myrsinaceae, Primulaceae, Plumbaginaceae, Sapotaceae, Ebenaceae, Oleaceae, Salvadoraceae, Loganiaceae, Gentianaceae, Apocynaceae (1963)

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FSA contributions 2: Asphodelaceae/Aloaceae, 1029010 *Chortolirion*. G.F. SMITH. 1995. *Bothalia* 25: 31–33.

FSA contributions 3: Asphodelaceae/Aloaceae, 1028010 *Poellnitzia*. G.F. SMITH. 1995. *Bothalia* 25: 35, 36.

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FSA contributions 7: Verbenaceae: *Vitex*. C.L. BREDENKAMP & D.J. BOTHA. 1996. *Bothalia* 26: 141–151.

FSA contributions 8: Ceratophyllaceae. C.M. WILMOT-DEAR. 1997. *Bothalia* 27: 125–128.

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FSA contributions 12: Plantaginaceae. H.F. GLEN. 1998. *Bothalia* 28: 151–157.

FSA contributions 13: Ulmaceae. C.M. WILMOT-DEAR. 1999. *Bothalia* 29: 239–247.

FSA contributions 14: Cannabaceae. C.M. WILMOT-DEAR. 1999. *Bothalia* 29: 249–252.

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